THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. V. No 103—7th YEAR.] LONDON, SEPTEMBER 30, 1856. [Subscription per Ann. { 15s. in Advance / 18s. Credit.] Price 8d. Unstamped.

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AN Advertisement, announcing the production by Mr. RICHARD LAMING of a very efficacious Oxide of Iron, as calculated to supersede that now so generally in use, having lately been inserted in the "JOURNAL OF GAS LIGHTING" and *Gas and Water Times*, the undersigned (referring for further particulars to their previous advertisements) hereby give notice, that they are still ready liberally to reward any one who will furnish them with legal proof of the use of any such Oxides by Mr. Richard Laming, or by any parties under Licence from him. And the undersigned again reiterate, notwithstanding Mr. Laming's assertions to the contrary, that, until the purchase by them of the whole of his rights to the use of Oxides of Iron, *Mr. Richard Laming was himself a Licencee under Mr. Hills' patent*, whose exclusive rights to the use of Hydrated Oxide of Iron in the purification of Gas he has admitted by Deed, and is still under covenant to support, though he persists in *publicly violating his engagements* in this respect with Mr. Hills, as he has done with the undersigned in bringing forward what he terms his "very efficacious Oxide."

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JAMES RUSSELL and SONS have great pleasure in calling attention to the annexed award:—

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"Office: No. 6, Charing-cross, London, April 6, 1854.

"Gentlemen,—I have much pleasure in informing you that the Jury has awarded to your firm 'HONOURABLE MENTION FOR LAP-WELDED IRON TUBES.' You are at full liberty, if you deem it likely to promote your mercantile advantage, to affix to these articles, during the season 1854, a card whereon this Award is printed, and your prices, with name of agent, &c.—I am, gentlemen, your obedient servant,

"JOHN H. BOHN, Secretary.

"MESSRS. JAMES RUSSELL and SONS, Wednesbury, STAFFORDSHIRE."

JOURNAL OF GAS LIGHTING NEWSPAPER

TO the Editor of the Bristol Mercury.

BRISTOL GAS.

Sir,—The well-known impartiality of the British press, and the high character of the journal you so ably conduct, render it superfluous for me to offer any apology for this intrusion upon your columns; the case is one of public interest, and my whole claim upon your attention amounts to no more than *audi alteram partem*.

In your publication of Saturday last I perceive an extract from the *Pharmaceutical Journal*, relating to certain experiments, by a Dr. Griffin, upon the incrustations formed on a copper boiler by the action of the Bristol gas. I will not now enter into an examination of the scientific—or rather the unscientific—nature of Dr. Griffin's labours, but reserve any remarks of that kind for the pages of the *Pharmaceutical Journal*, to which I am about to send a communication: my present object is merely to solicit the attention of the citizens of Bristol to those portions of Dr. Griffin's report which are within the comprehension of the humblest intellect, and which, from my own knowledge, I know to be grossly exaggerated, or altogether incorrect. For this purpose it will be unnecessary for me to dwell upon the remarkable fact of a chemist conducting any gaseous experiment in such a medium as the atmosphere of a laboratory, or make any comment upon the incredible absence of ammonia in the "greenish substance which proved to be sulphate of copper;" neither will I offer any remark upon the *non sequitur* conclusion, that because the gas contained no sulphuretted hydrogen, therefore, "all this sulphur must be in the form of bisulphuret of carbon." On the contrary, my criticism shall be of such a kind as my own individual experience of the Bristol gas warrants me in proclaiming; and therefore I begin at once by contradicting most decidedly Dr. Griffin's assertion, that "the contamination"—meaning the bisulphuret of carbon—"has increased since the reduction in the price of gas:" it has done no such thing, nor has there been any change in the nature or quality of the coal from which the gas is and has been obtained.

It is now about six years ago since I was called upon to examine the gas at the Canons' Marsh Station of the Bristol Gas Company, and to analyse and report upon the nature and impurities of the gas, and of the coal from which the gas was made; the results of those analyses are now before me, and when contrasted with some others quite recently completed, enable me to declare that the differences between them, so far as the gas is concerned, are in favour of the gas now manufactured, which closely resembles in character the great bulk of the London gas; whilst, as regards the coals, they are from the same mine, and contain no larger amount of impurity than they did six years ago, and subsequently to that period, or about four years ago.

With regard to the amount of sulphurous contamination in the Bristol coal gas, whether arising from bisulphuret of carbon or other sulphuretted compounds, I am able to assert, and do assert, as the result of a recent analysis, that the Bristol gas is quite as pure as the ordinary coal gas of this metropolis, where thousands of people burn gas in private houses without any of the awful consequences so romantically imagined by Dr. Griffin.

There is, however, a very easy mode by which any person may convince himself of the perfectly innocuous nature of the condensible products from coal gas of all kinds, and which is as follows:—Having filled a large globular glass vessel with small pieces of ice, let it be suspended near the ceiling of a room or shop in which gas is burnt; the aqueous and other vapours generated by the gas will condense upon the surface of the globe exactly as they would do on the "curtains, paper-hangings, pictures, bindings of books, and metal goods," alluded to by Dr. Griffin; but with this difference, that they will accumulate on the surface of the globe, and drip from it in drops, which may be collected in a tumbler or other convenient vessel placed to receive them. Thus, then, any quantity of these awful products may be gathered; and of what do they consist? Of water! mere simple water! containing a most infinitesimally small quantity of sulphate of ammonia; but vastly more pure than any spring or well water in the kingdom! I have collected water of this kind lately in Bristol, and defy any person to distinguish it, by either taste or smell, from clear or carefully-filtered rain-water. I have drunk it repeatedly, and so have many other persons, without the slightest inconvenience or ill consequence.—I am, sir,

Your very obedient servant,

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These RETORTS are generally used in the Gas-works of Preston, Accrington, Bury, Heywood, Middleton, Rochdale, Ratcliffe; the Mills of Messrs. Horrocks, Miller, and Co., Preston, &c. &c., and are unequalled in having afforded general satisfaction to those who have given these Retorts a trial.

To meet the increasing demand, the Works at Little Harwood have been greatly enlarged; and Gas Engineers who may favour with an Order may rely with confidence on their being promptly supplied with an article not to be surpassed in finish or durability.

PRICES MODERATE.

CONTENTS.

	PAGE
Leading Articles:—	
Notes on Passing Events	531
Popular Fallacies on "Pure Water"	533
Circular to Gas Companies	534
Communicated Articles:—	
Mémoire upon the Nature and the Origin of the Alluvions at the Mouths of the Rivers which fall into the British Channel on the French Shore	534
The Recent Visit of Judge Lynch to the City Gas-Works	536
Register of New Patents:—	
Sturges' Improvement in Rotatory Fluid Meters	537
Hills' Improvements in Treating Fatty and Oily Substances	537
Provisional Protections	537
Notices of Intention to Proceed	538
Miscellaneous News:—	
The Metropolitan Board of Works	538
City of London Commission of Sewers	540
Attempt to Destroy a Theatre at Liverpool	542
Price Current	541

TO CORRESPONDENTS.

One who Formerly Resided in Portsmouth.—*The chairman of the company in question is Mr. Gillman, and the engineer is Mr. Armstrong. The water is not filtered, and the supply is said to be "very intermittent indeed." We do not know what the Board of Health has done in the matter.*

F. A. R., Hoxton.—*We have heard, but cannot answer for the accuracy of, the statement alluded to, that an accident occurred on Friday last at the Great Central works at Bow Common, by which two men, named Willing and Russell, were so severely injured as to require to be taken to the London Hospital.*

NOTICES.

The next number will be published on Tuesday, Oct. 14, and the subsequent numbers on each successive alternate Tuesday, till our project of weekly publication is carried into effect.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

All Communications to be addressed to the Editor, No. 3, Parliament Street, Westminster; and orders for Advertisements to Mr. W. B. King, the Publisher, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, SEPTEMBER 30, 1856.

NOTES UPON PASSING EVENTS.

"*Quis custodiet ipsos custodes?*" Our Legislature has latterly affected to have been shocked by the frauds of small tradesmen and by the adulteration of food, but it obstinately closes its eyes to the heinous offences against social, or even commercial, morality of many of its own members, and allows some of the branches of the Administration to circulate wilful falsehoods without reproof or comment. The disclosures of the proceedings of the parlour of the Royal British Bank, in which, again two members of Parliament figure very conspicuously, furnish an additional proof, were such needed, that the evil which is at the root of the deceptions and frauds all must combine to reprobate, is far deeper seated and more general in its effects than it suits the purpose of our place-makers to believe. The Houses of Parliament should purge themselves, and insist upon, a higher tone of political and pecuniary morality in their own ranks, before they enter upon a crusade against the vendors of impossible mixtures of alum and bread; and they should set an example of strict probity before they pretend to punish what may be the minor delinquencies of others. We believe that it will be found that such men as James and John Sadleir, and most of the other members of the House of Commons who have lately earned such bad celebrity, were advocates for the various dishonest measures which have passed the Legislature, especially for the Limited Liability Acts in their present form. But, if it be replied to this practical satire upon our law-makers, that it is impossible to secure the morality of all the members of so large an assembly, it may be observed, as a rejoinder, that it is at least possible to secure that they who are selected to administer the affairs of the nation should be men guided by principles of high tone, and that the example of systematic deception should not be set by the Government itself. Yet this, we fear, has actually been the case within a very recent period; and the principal authorities of the General Board of Health and of the Registrar-General's office have countenanced assertions, and have assisted in the diffusion of doctrines, which they must know to be so totally in opposition to facts, that we are painfully forced to arrive at the conclusion, that the moral principles adopted by some portions of our Administration are in nowise superior to those of the vulgar deceivers of every-day life. These two branches of the Administration were designed to collect and record information for the benefit of the public; if, then, they promulgate false doctrines, and make, or allow to be made under their sanction, false statements, are they not as reprehensible as the man who sells chicory for coffee, or sloe-leaves for tea? Is not the adulteration of the intellectual food of a nation as much and as justly the object of the solicitude of a parental government as the adulteration of its physical food? And, even if the Government should in this matter (as we hold that it ought to do in all) adopt the "*laisser passer, laisser faire*" principle, ought it not carefully to watch that its subordinates do not expose it to the accusations it now does not scruple to bandy with others?

These remarks are extorted from us by the speeches and the conduct of the English deputation (which was sent by the English Government, we suppose, from its composition), representing our nation at the *Congress de Bienfaisance*, lately held at Brussels. The congress was held for the purpose of discussing what had been done, and what could be done, for the benefit of the poor and suffering classes of the community; for it must be observed that, notwithstanding the elaborate organisations of continental paternal governments, the vital problem they all have to consider is the condition of the turbulent working classes. England was represented on this occasion by Mr. Cowper, president of the General Board of Health; by Drs. Farr, Waller Lewis; Messrs. Ewart, M.P., E. Chadwick, Simon, and (*credat Judæus!*) F. O. Ward, of the Board of Health, as he styled himself. On the first day of meeting, Mr. Ward took up his parable in the name of our native land, and proceeded to observe—we quote in all important parts the words of the report in the *Independance Belge*, as closely as we can translate them—

> That there were two manners of considering the question of public beneficence—one being addressed to the prevention of the evils which bore down the poor, and the other to the means of alleviating those evils which had already arisen. We, in England, have thought that it was easier and cheaper to prevent the distress which is generally produced by ill health, and this last by pestilential miasmas, and likewise by the pauperism which leads to vice and crime. We have, then, endeavoured to prevent the diseases produced by the accumulation of refuse in towns; and, starting from the pinciple that "prevention is better than cure," we have directed our attention to the practical means to be adopted, and the result of our investigations may be explained by the formula, "circulation instead of stagnation." Then we elaborated a tubular system, which consists in the connection of town and country by means of four sets of pipes; the first is destined to conduct pure water into the towns, the second to distribute this water, the third to remove refuse from the towns, and the fourth to apply this refuse, so removed from the towns, to the fertilisation of the country.
>
> *A hundred towns are already more or less organised to enjoy a distribution of the purest and softest water, and to remove their refuse, which, on the other hand, goes to fecundate the land. The expense of a distribution of pure water instead of an indifferent water is thus diminished one-half, as is likewise that of the removal of the refuse. It has been shown by calculation that the cost of a distribution of water is about 1½d., and of the sewers of 1d. per house per week. By this system the mortality in towns has been reduced 50 per cent., and the fertility of the land almost quadrupled!!!*

Now, precisely as many assertions as are contained in this last paragraph, precisely so many errors are there; and, moreover, we strongly suspect that not only Mr. F. O. Ward, but also every other member of the deputation, must have known that what he said was not true. As none of those parties attempted to set Mr. Ward right, or to inform the congress of what really has been done in England, they must be considered *participes criminis* in this extraordinary attempt to mislead Europe. In the name of the engineering profession—in the name of all true sanitary reformers—we energetically protest against so disreputable a course of proceeding; and earnestly do we beg foreign scientific or administrative authorities, after this flagrant illustration of either their ignorance or, as we suspect, their bad faith, to receive with distrust any assertions emanating from the parties who have so disgraced the scientific reputation of our country.

For, even if a hundred towns have lately undertaken the execution of works for drainage and water supply, we are sure that there are not *ten* which have even attempted tubular works for the distribution of sewerage manure. As to the supply of the purest and softest waters, Mr. Ward and his colleagues know perfectly well that there are not ten towns which have adopted any tubular system such as he alludes to

of securing that object, or which have even made extraordinary sacrifices to secure soft water. It is only at Woolwich, we believe, that water has been softened on a large scale by the process Mr. Ward was so anxious to display—in season and out of season—to the congress; and we are only acquainted with the neighbourhood of the towns of Rugby and Watford where liquid sewerage is applied. But we waive the question of the precise number in either case, further than this, that we assert that there are not ten towns which are organised upon the system Mr. Ward states to have been, more or less, applied in a hundred. Is the phrase, "more or less," introduced as a means of escape?

We think that the inhabitants of Southampton, Croydon, Epsom, Dover, Sandgate, Dartford, Newmarket, Ely, Rotherham, Hitchin, &c. &c., will stare when they see the assertion, that the "tubular system of circulation" has diminished the cost of water and sewerage works one-half. If this be true, how are we to account for the fact of the enormous rating of the towns which have been unfortunate enough to follow the advice of Mr. F. O. Ward and of his friends? We call upon all who are in power, and who desire to learn the truth of this matter, to press for the publication of the returns from the various boards of health moved for during the last session by Mr. Tite, M.P. These are questions of fact; and sure we are that, unless they be made comfortable, the facts which will appear in these returns will disclose a state of things of which the public has no conception, but which will flatly contradict the assertion that the tubular system of the Board of Health has secured any economy in the distribution of water, or the removal of sewerage. But the gross absurdities of Mr. Ward's statements almost defeat themselves, or they furnish a bitter satire on his friends; for, if the tubular system of circulation have diminished the cost of the respective works one-half, and the present cost of the water-supply in model towns be, on the average, 1½d. per house per week, the cost of such supply must, in 1848, have been, on the average, about 3d. per week per house; yet the 76th clause of the Public Health Act only makes a supply compulsory when it can be obtained at the rate of 2d. per house per week; that is to say, either the framers of this act introduced a clause which they ought to have known was a delusion, or Mr. Ward has not correctly stated the real cost of such services either then or now. The best commentary on this assertion is, however, to be found in the fact that the "autumn leaf"—Mr. Cowper's Public Health Bill—only proposed to render a water-supply compulsory when it could be afforded for 3d. per house per week.

But the last of Mr. Ward's assertions is the most surprising; and we are at a loss to explain the conduct of Dr. Farr, who could sit by quietly whilst so manifest an exaggeration, to use the mildest phrase, was being published with the sanction of the British Administration to the assembled representatives of Europe. Mr. Ward said that "the mortality of the towns had been diminished 50 per cent., whilst the fertility of the fields had been almost quadrupled." We distinctly assert, that in no one town of the United Kingdoms has any such diminution taken place. The mortality in many of the towns where the tubular system of circulation has been applied has, on the contrary, increased; and we appeal to the inquiries made by persons employed by the Government itself to prove the injury and misery that system has inflicted, especially upon Croydon and Sandgate. The result of the trials of sewerage manure distribution is still so problematical, that it is absurd to say that it has quadrupled the fertility of the land.

There was no opportunity offered by the directors, or managers, of the congress to contradict these extraordinary perversions and suppressions of fact; and they have gone forth to Europe as the statement of the professional, scientific, and administrative authorities of a country which professes above all things to be practical and honest. In the most distinct terms, however, we here protest against any such inference; and we assert that Mr. Ward and those about him ought to have known full well that, in making the statements he did, he was, to use the mildest term, greatly exaggerating the results which have been attained. But may we not also ask, Who is responsible for the disgrace which such proceedings must entail upon the scientific reputation of our country?

In England itself some rather important proceedings have taken place, which mark painfully the temper of the times. The proceedings of the City of London Commission of Sewers, with respect to the City Gas-Works, are characterised by the same spirit of sacrificing private rights to popular prejudice we can so distinctly observe in recent public measures. The City Gas Company established its works in accordance with the laws; it has confessedly adopted every method which has been suggested for preventing its operations from becoming nuisances to the neighbourhood; people will burn gas, and they refuse to pay high prices for that article; and yet the public call for the suppression of a so-called nuisance of which it gladly avails itself, and which has as much legal or moral right to exist as any other factory in the heart of the City. Unquestionably, it may occur that an establishment which was once, comparatively speaking, harmless, may become objectionable in course of time; but, so long as the establishment in question is conducted in accordance with law, and in the most approved manner, no one has a right to call for its compulsory removal, *without due compensation*. Herein lies the injustice of this cry; for the word *compensation* is never uttered by the would-be reformers, who would loudly complain if their own tallow-melting shops, their private slaughter-houses, or their noisy factories, were interfered with on account of the annoyance to their neighbours. The constant noise of the printing-press of the *Times*, through the night, is to many a nuisance as great as the smell of a gas-work; yet the "Thunderer" would hardly like the no-law it proposes for others to be applied to itself. Substantially, the question is whether the City Gas Company or the Derby Gas Company, which is in a similar position, have neglected to adopt necessary precautions. If they have done everything, and the householders still object to the retention of such factories in towns, they must be prepared to pay for their removal, either directly or indirectly—as our neighbours, the Parisians, have done, by consenting to an increase in the price of gas, on the condition of transferring all the gas-works to the outside of the town. In the meantime, we would ask, whether it is delicate on the part of Dr. Letheby to interfere in any way with this discussion? It is notorious that the company by which he is employed and paid, is said to be in treaty with the City Company for the purpose of supplying it with gas, and thus avoiding the necessity on the part of the latter of manufacturing that article in the town; and we confess that we more than question the delicacy of Dr. Letheby in lending himself to a popular cry, which must act in a manner to compel the City Company to throw themselves into the hands of his clients. But, be this as it may, the important point for the consideration of all parties interested in the maintenance of the security of property, in the question raised before the City Commission of Sewers and at Derby, is, that an attempt is being made to sacrifice the lawfully acquired and exercised rights of manufacturing establishments in deference to a popular cry. A great social principle is involved.

The Home Secretary does not seem to have profited by the lesson read to him by Mr. Williams and by the Society of Arts; for the persecutions for *non-combustion* of smoke—for not effecting an impossibility, in fact—have been resumed, to the great benefit of the police, no doubt. It is unaccountable to us that some one should not appeal against the decisions of the very worst tribunals we have, and that the manufacturing interests should consent to remain at the mercy of a needy and corrupt set of informers; equally unaccountable is it that a man of Sir G. Grey's discretion and common sense should persist in enforcing a law which is universally condemned by all competent parties.

The Metropolitan Board of Works has resumed its labours, and we hope that now it may act more energetically than it did in the early periods of its existence. We have not received the report of its proceedings in time to make any comment upon them at present, and we therefore content ourselves by calling the attention of our readers to a translation of an article from one of the French engineering publications, which, we believe, will throw some light upon the question of the best position for the outfall of the intercepting sewer. This article will be found in the portion of our JOURNAL headed "Communicated Articles;" and at any rate it will show that the rejection of the scheme presented to the First Commissioner of Works, simply on account of the indications of a float, argued a supreme ignorance of the complicated investigations required in these cases. For some time to come, moreover, the proceedings of the Metropolitan Board of Works will be watched with curiosity, for the report upon the failure of the pipe-sewer in Bayswater will naturally revive the struggle which has been so long and so bitterly fought by Messrs. Doulton and the other glazed pipe-makers.

We also call attention to an error we made in our remark

upon the quantity of water pumped into London, inserted in our last number. The total quantity is 80,000,000 gallons, instead of 70,000,000; and the average supply per head is 32 gallons, instead of 28 gallons, per day.

POPULAR FALLACIES ON "PURE WATER."

A THEORETICAL acquaintance with the science of "cosmogony" induced the immortal Ephraim Jenkinson to conclude that "the world was in its dotage," and, acting up to his impressions, this consummate rogue treated the world accordingly; but, had Mr. Jenkinson lived in our day, he would have found it more advantageous to exclaim, "The world is in its childhood," and wants to be protected from the dangers incidental to that condition! Not that there is any deficiency in the number of individuals desirous of becoming wet-nurses to society, but merely because persons of the Jenkinson class seem instinctively to seek such situations; and our well-known friend was possessed of the exact amount of "Greek" and other learning to qualify him for any public duty in the "sanitary, reformatory, or anti-adulteration" line. Who better than he could beat out the gold of a grain of information into the gilt of an acre of display? or who more adroitly shut up his wisdom when the occasion required it? Such men are wanted at the present moment, for assuredly "the world is in its childhood." True, indeed, we ought to be getting more and more learned every day, for scarce an hour passes without the production of some great discovery, which makes a fool of all its antecedents, and casts the knowledge of yesterday into the remote abyss of barbarism. The great wonder of the age now is to find out how our ancestors lived, through the dire effects engendered by their extreme ignorance. Of ventilation they knew nothing—not even the art of "puffing"—whilst, in respect to oxygen, nitrogen, and the science of breathing, their want of knowledge must have rendered life hazardous in the extreme. It is awful to contemplate the perils they had to contend with in struggling for an existence—the air they breathed contained poison, the food they eat was poisoned, and the water they drank was "spring water," which every one now knows it is dangerous even "to water the roads with." The fact is, that modern science has rendered it very problematical whether these ancestors of ours ever lived at all; and it is quite certain that if they did so, they lived in opposition to the laws of Nature, and ought never to have reached maturity. We are a very clever and fast-improving nation; but still, philosophically speaking, "the world is in its childhood," and is only now beginning to know "what to eat, drink, and avoid." For nearly six thousand years people have been accustomed to drink spring water, ignorant, meanwhile, of its fatal qualities, and blind to the fact, that it is scarcely fit for the purpose of watering roads! Of course it will excite no surprise when we state that all these persons are dead, because this kind of water contains nitric acid in combination with lime: it is not pure water, and if it were, this also is injurious to life; for even fish themselves cannot live in the water obtained from melted snow, which is pure water, and produces *goître, crétinisme*, and other diseases in human beings who drink it. In whatever direction, therefore, we turn, Science warns us from water-drinking with all the eloquent reasoning of a Falstaff. Liebig has shown that rain water contains nitric acid, and more especially after thunder-storms; geology proves that spring water is derived from rain water, and must therefore contain nitric acid in some shape. A learned sanitary officer has proved that this is actually the case in the parish of Marylebone, and has accordingly shut up all the pumps in the parish as so many sources of poison and disease. Happy parish of Marylebone, to be blessed with so watchful an officer of health! but from whence will you derive water destitute of nitric contamination, if the great Liebig be correct? River water is only a modification of spring water, and this we have seen is rain water, and contains nitric acid. Where, then, can water be had which is fit for anything but "watering the roads?" Of a truth, the parish of Marylebone is in a perilous condition from one cause or other, and we seriously solicit the attention of the ratepayers to the circumstance; either they are most grievously bamboozled, or their churchyards must be very full. To find any natural water free from nitric acid in one form or other is clearly impossible. Dr. Wollaston detected it in the water of the ocean, and Liebig has found it in that which falls from the heavens: if, therefore, it be injurious to health, as has been represented, there is no great hope of health in this world, except by a curious modification of the "total abstinence pledge," under a vow "never to drink water."

A question now arises, as to whether it be safe to wash in this fluid, and here again the light of Science steps in, and detects Nature in her bungling and imperfect attempt to carry out her own laws. It has, we believe, upon some rare occasion happened that one of those laws which emanate from parliamentary wisdom has had a slight flaw in it that required a touch of amendment; consequently, we might excuse Dame Nature in her trivial legislative slips; but she is never right—never perfect; and her laws, as they are called, are one mass of unscientific regulations, that contradict and stultify each other. If the old lady had common sense, she would call in the Board of Health without delay, and get honest advice, if it be to be got at that immaculate source of superhuman knowledge. True, indeed, this might endanger the welfare of the community; for, although possessed of the most surprising powers of intermeddling with anything and everything, still the Board of Health cannot, we fancy, do more than one thing at a time to do it well; and, therefore, Nature's application might lead to fearful consequences. But the English are celebrated for generosity; and we feel certain that upon this occasion we speak the sentiments of the whole empire when we say that, for so great and good an object, Nature may take the Board of Health and keep it until she has done with it; and, if her requirements should happen to be eternal, we will make up our minds to the loss with becoming resignation and patience. But, to return to the washing question, it is notorious that, as we can find no water fit to drink, so there is none fit to wash in, except that which has been prepared by the hand of Science. In large towns rain water is a mere carbonaceous mud, not to be thought of. Spring water contains sulphate of lime, carbonate of lime, carbonic acid, organic matter, and, as we have seen, nitric acid or nitrate of lime—a frightful category of anti-detergents; and river water is merely spring water, as everybody knows. Where, then, is the poor townsman to wash his civic face? Science—glorious Science!—ever at hand, answers, as readily as Elisha answered Naaman, "Put lime into thy water, and wash in safety." Yet lime will only remove the carbonic acid and carbonate of lime from water, whereas the common soda, so universally employed by our washerwomen, will decompose the whole of the fearful list given above. What, then, are we to conclude? Are Science and the Board of Health combined inferior in practical knowledge to an old washerwoman? Such, gentle reader, is the only conclusion that common sense warrants; and we advise thee to eat, and to drink, and to wash after the manner of thy ancestors, and peradventure thou mayst live to see the end of the Board of Health, and the termination of all such gross jobbery and empiricism.

Meanwhile, it is some comfort to reflect that the Board of Health and its *employés* have not got all the science of the subject to themselves; but that, on the contrary, the most judicious physiologists of the day agree in regarding the presence in water of some of the salts of lime as a manifest advantage, and one without which neither animal nor vegetable life could attain a healthy development: nay, the great Liebig even advises us to put lime in our bread! It might, indeed, have been surmised by any person not inflated with the presumptuous folly of a sanitary inspector, that since the Divinity has nowhere furnished the earth with water destitute of lime, so it formed part of His great design by this means to supply the requirements of "all the dwellers upon earth"—a circumstance beautifully illustrated by the fact, that both plants and animals contain lime as an element essential to their perfect structure. But, "No!" exclaims the bursting vanityof our sanitary intermeddler; "the Divinity is always defective—always in need of assistance; there is nothing perfect but the Board of Health, which is the natural equipoise to the failings and errors of Providence."

Such, in plain words, is the language daily held forth by these place-hunting empirics; and, more marvellous still, such is the language daily listened to in patience by an over-taxed, and not illiterate, people! How long this is to last we cannot pretend to say; but the reign of Fraud and Deceit, not to mention Impiety, was never lengthy. The air we breathe, the water we drink, the food we eat—nay, the very ground we tread on—have all been perverted into a means of jobbery and governmental corruption. "Place! Place!! Place!!!" is the great cry of the day, from the Premier who gives, to the sycophant who receives; and all this is glossed over by a hollow

anxiety for the public health, as if the all-wise Being, to whom we owe more than life itself, had left mankind at large dependant upon boards of health and government commissioners for the preservation of that to which life is indebted for its principal pleasures: the mere idea is intolerable.

Circular to Gas Companies.

We perceive that the City Sewers' Commission has again roused itself into a kind of frantic fury at the alleged nuisance of the City Gas-Works; and certainly, if we could as easily swallow the declarations of John S. Hodgson, superintendent, as they are gulped down by the Sewers' Commissioners, we should be able both to appreciate and sympathise with the denunciations so "unanimously" thundered forth whenever the name of the City Gas Company is mentioned in the vicinity of Guildhall. As, however, we can neither digest Mr. Hodgson's raw material, nor the more carefully cooked statements of Dr. Letheby, we must be permitted to express our surprise at the acknowledged fact, that the more the City Gas Company has done to diminish the nuisance, by "appealing to the highest scientific authorities," the greater has been the outcry made against their works. Of two conclusions deducible from this fact, one must be true; either "the highest scientific authorities" are of no use in diminishing the nuisance of a gas manufactory, or there was originally no great nuisance to complain of at the City Works. Perhaps, after all, the last is the true solution of the anomaly, and the real object sought was, not to get rid of a nuisance, but to get rid of a gas-work; and, now that the matter has once more passed into the hands of those not altogether uninterested in the result, we may expect an appeal to the "*ultima ratio*" without delay. Nor can such an appeal be regarded as otherwise than desirable for the gas company itself: to be pestered, tormented, and thwarted at every step by the perverted power of a degraded section of the Corporation of London, is surely enough to make any respectable body of men weary of defending a position, however honourable; and, as it has long been clear that, "*per fas aut nefas*," the whole force of municipal tyranny will be put in action to attain the desired end, the sooner we see the extent of that power the better for the interests of honesty and fair trading. The means to be employed are not unknown to us, and we shall watch the conduct of those who "pull the strings" with no ordinary share of vigilance.

Meanwhile, this subject, we are glad to see, has brought our esteemed correspondent, Mr. Lewis Thompson, once more into the arena; whose letter, inserted in another part of our columns, will, no doubt, be read with the interest which usually attaches to that gentleman's communications. With an honesty of purpose which laughs misconstruction to scorn, Mr. Thompson seems instinctively bent upon the exposure of fraud and deceit, whilst, at the same time, he never hesitates to render full justice to any opponent. Of this latter quality we have a pleasing example in the compliment long ago paid to Mr. Croll, as "the original discoverer" of the invaluable process of purifying gas by means of the oxides of iron. It now appears that Mr. Thompson was quite right in awarding to Mr. Croll this title, as it can be proved that Mr. Croll not only patented, but for "more than 15 months" actually used, the oxide of iron "mixed with breeze" for the purification of coal gas.

Curiously enough, too, it has lately been shown, from the experiments of Mr. Alfred King at Liverpool, that the oxide of iron, when surcharged with sulphur, by repeated use may, on being burnt at a red heat, so as to expel the whole of this sulphur, be again employed with undiminished effect in the purification of gas, exactly as described in Mr. Croll's specification of the year 1840. This is a circumstance well worthy the attention of those gas companies who, from any cause, may be compelled to discontinue the use of lime, as it promises to render the employment of the oxide of iron even less expensive than lime. We consequently wait for the conclusion of Mr. King's experiments with a degree of interest that amounts almost to anxiety; for, independent of the important value of the inquiry which now engages that gentleman's attention, we know and feel that whatever *is done* will be *well* and *skilfully* done, and supply the gas world with an amount of practical information, on the subject of purification by oxide of iron, which we have hitherto hoped for and looked for in vain.

As a proof how little the process has been understood, we may state that Mr. King has already proved that a much larger purifying surface is requisite with oxide of iron than with lime, under equal velocities of current in the gas to be purified; and he has also clearly demonstrated that the corrosive action of the salts generated by the revivification of the oxide of iron is such as to render the use of wrought-iron sieves in the purifiers quite inadmissible. Meanwhile, the amount of pressure created by the iron process is much less than with lime. Mr. King will deserve, and doubtless receive, the thanks of his professional brethren for an elucidation of this obscure process; and, as we are promised a copy of his report upon it, we shall have great pleasure in laying the whole in due time before our readers. The mixture at present employed by Mr. King is composed of two parts by weight of the sulphate of iron and one of slaked lime, intimately ground together, with the addition of a small quantity of water; after which the pasty mass is exposed to the air in small pieces to dry and oxidise, when it is broken up into a fine powder, and used exactly like lime. Samples of this mixture have been used, burnt, and used again, more than eighty times in succession, without losing their purifying power. In the present age of sanitary sophistry, it is some comfort thus to find that even the tyrannical requirements of folly may, perhaps, be complied with without absolute ruin.

Communicated Articles.

MEMOIRE UPON THE NATURE AND THE ORIGIN OF THE ALLUVIONS AT THE MOUTHS OF THE RIVERS WHICH FALL INTO THE BRITISH CHANNEL ON THE FRENCH SHORE.

By M. Marchal.

Ingénieur des Ponts et Chaussées.

[Translated from the "*Annales des Ponts et Chaussées*," March and April, 1854.]

The author of this notice—having had occasion, in the execution of his official duties, to make and to examine numerous analyses of the sands thrown upon the coasts of the Channel, or at the mouths of the rivers which fall into it, and to visit Holland in detail—has also collected his observations upon the facts which have taken place, or which continue to take place, in the mouth of the Seine, before and after the execution of the embankment of the maritime portions of that river. He has united these various documents and observations in the form of a "*Mémoire*," which he submits to the consideration of the engineering profession.

The question which the author proposes to discuss has already been noticed by M. Bouniceau, in the book he published upon the navigation of tidal rivers. At page 76, that engineer cited particularly the opinion of Mr. Henry Palmer, an English engineer, upon the small importance to be attached, in preparing projects for the improvement of the mouths of tidal rivers, to the river alluvions.

Many other engineers have examined the same question. M. Lamblardie, in particular, wrote in 1789 a *Mémoire*, which was printed at the time, but has since become very scarce, upon the corrosions of the shore of the Seine Inférieure, and the preservation of the Cape of Etretat. This *Mémoire* ought to be consulted by all professional men who are interested in the important question of the improvement of harbours and rivers, either in England or in France. Many observations contained in it have been adopted in this *Mémoire*, and they are of a nature to fortify and confirm the opinions we had formed before we were aware of its existence.

We do not, therefore, propound any new theory; and, indeed, if in a matter so long studied as the laws affecting the mouths of rivers—in a question which has so long occupied the attention of engineers of all countries— we did enunciate ideas never before expressed, there would be strong grounds for questioning them, and great probability of their being false.

The object we have proposed to ourselves is much more modest, and consequently more sensible. We believe that we can add a further proof to those already given by MM. Lamblardie, Palmer, Bouniceau, and many other engineers, to show that in the banks formed at the mouth of the Seine the quantity brought down by the river is very insignificant. We shall endeavour to estimate the precise proportion of its contribution; and we shall prove that the same law holds with respect to the mouths of the Rhine and of the Scheldt, as also that the sands in the bay of Mont St. Michel are exclusively of marine origin. Lastly, we will make some observations upon the sands carried down by the Loire, in order to point out the difference which exists between the *embouchure* of this river and that of the Seine.

With respect to the rivers of the Mediterranean, it is not our intention to make any observations; and we content ourselves by observing that the Italian engineers consider the fluviatile origin of their *deltas* to be demonstrated. This opinion, which appears

to us to be at least probable, is in nowise opposed to the opinion we express in the following article; because, in the *embouchures* exposed to the action of strong tides, there is a double action at work, in the corrosive effects of the waves upon the coast, and in the great velocity of the ascending and descending currents.

M. Bouniceau thus resumes (page 113 of his book) his opinions as to the origin of the fluvial alluvions of rivers subject to great tides :—"It follows, from the second chapter, that the decomposition of rocks always supplies new alluvions to rivers; but the gravel and shingle do not generally descend to the lower parts of their course; and usually it is only the mud and sand which are carried to the sea, where, in conjunction with the marine alluvions, they form *deltas*."

M. Beaulieu, in a printed report upon the first results of the works in the Lower Seine, thus expresses himself :—"The cube of the alluvial matters coming from the up or down stream, or the cube of the new matters deposited behind the bank, amounts to 17,941,448 mètres. It would be interesting to ascertain the proportion in which these matters are supplied by the up stream, or by the down stream; but it is impossible to decide this question in the absence of the results of direct experiments upon the quantities of matter in suspension in the waters of the Seine. Some such experiments are now being made at Villequier, and at Rouen, in order to solve this element of the question; but, if we only judge by the habitual limpidity of the waters of the Seine, properly so speaking, and by the troubled state of the tidal waters, it is no longer doubtful to our minds that the major portion of the deposit behind the banks is supplied from the bay."

Lastly, M. Belgrand says (page 68 of his last *Mémoire*), "Is there any necessity for restraining within insubmersible banks either the Seine or its principal affluents? (He was discussing the Seine above Paris.) By raising the plane of the water, a great augmentation in the velocity of flow would be produced, and the matters in suspension during torrential floods, instead of depositing in the lower plains, which they now fertilise, would descend to the mouth of the river, where they would produce great banks, similar to those which are found at the mouths of the Po. M. Lombardini has shown, in fact, that the earth carried down by that river does not raise its bed, as was long believed to be the case; but that they form a new plain in the Adriatic, which extends about 270 feet every year. Deposits of this nature in the lower Seine, where the waters are driven back by the tides, would give rise to a rapid silting up of the bed of the river, and the destruction of the navigation between Havre and Rouen."

Thus MM. Bouniceau, Beaulieu, and Belgrand have endeavoured to explain the influence of the alluvial matters brought down by the river upon the navigability of its mouth, without, however, defining the importance of this fluvial element upon the formation of the banks. The two first do not appear to attach much importance to the matters thus furnished; and we believe that it may be asserted as a principle, that in the Seine, the Rhine, the Scheldt, and the Meuse, the quantity of the fluvial alluvions is very small in comparison with those supplied by the sea; and we will endeavour to give in figures a maximum limit to their proportionate values. We desire to record this principle now, before the publication of the results of the experiments by M. Doyat (upon the quantities of matter in suspension in the Seine), because if, as we are convinced it will be found to be the case, these experiments lead to the same conclusions, they will furnish an additional proof of the correctness of the principle; and the testimony thus given by M. Bouniceau, by the English engineers, and in this article, corroborated by the experiments of M. Doyat, would place the fact beyond the possibility of doubt.

We collected in the Seine, at Caudebec and Quillebœuf, in the maritime portion of the river, and at the point where the new banks produced their effect, samples of the sand deposited before and behind those banks. The composition of these sands, analysed at the *Ecôle des Mines*, was as follows :—

Sand deposited in front of Banks at Quillebœuf.		Alluvions deposited behind Banks at Caudebec.		Alluvions deposited in the Port of Rouen.	
Sand	0·81	Sand	0·62	Sand and clay*	0·36
Oxide of iron	0·01	Peroxide iron.	0·03	Gelatinous silica.	0·11
Carb. lime	0·15	Carb. lime	0·28	Alumina	0·03
Water	0·03	„ magnesia	0·005	Peroxide iron	0·04
		Water and volatile substances	0·06	Carb. lime.	0·37
				Water	0·08
	1·00		0·995		0·99

We also requested the director of analysis in the *Ecôle des Mines* to examine the following substances :—

Mud from Inner Basins at Dieppe.		Sea-Sand forming Base of Alluvions of Zealand.		Land called Schore of Zealand.	
Clay	0·33	Sand	0·957	Sand and clay	0·54
Gelatinous silica	0·09	Oxide iron.	traces	Gelatinous silica.	0·14
Alumina.	0·033	Carb. lime	0·033	Alumina	0·04
Peroxide iron	0·05	Water	0·007	Carb. lime.	0·12
Carb. lime	0·05			„ magnesia	0·02
Magnesia	traces			Water	0·09
Alkaline chlorides.	0·01				
Water	0·107				
(*Sic in orig.*)	0·990		0·997		0·99

* Sand, 0·22; clay, 0·14.

These analyses we compared with those we had previously made in 1841, 1842, and 1844, of the sands of the bay of Mont St. Michel, and of the harbours of Lessay and De la Rôque, which were as follows :—

	Tangues from Banks of			Sand obtained on the Limits of Low Tides.	Tangues of the Harbour of	
	La Séline.	La Sée.	the Couesnon.		La Rôque.	Lessay.
Soluble salts	0·0021	0·0029	0·0078	0·0071	0·0026	0·0133
Carb. lime	0·3837	0·4144	0·3081	0·2658	0·4300	0·5322
„ magnesia	0·0163	0·0095	0·0152	0·0131	0·1039	0·0848
Phosph. lime	0·0173	0·0139	0·0139	0·0110		
Silica	0·4027	0·3989	0·4519	0·6500	0·3760	0·1934
Alumina	0·0588	0·0581	0·0659		0·0251	0·0878
Oxide iron	0·0590	0·0601	0·0554	0·0052	0·0183	0·0641
Water, &c.	0·0501	0·0379	0·0818	0·0462	0·0449	0·0240
	0·9900	0·9957	1·0000	0·9984	0·9999	0·9996

Lastly, we add to these elements of comparison two analyses of the *tangues* of the bay of Veys, made by M. Isidore Pierre, professor at Caën. (The word *tangue* is a local word, and is applied by the inhabitants of the Lower Normandy to the sea-sands, which are susceptible of being used in agriculture on account of the lime they contain.)

Substances.	Tangues of Isigny, above the Bridge of Vey.	Tangues of Isigny, below the Bridge of Vey.
Chlorine Sulphuric acid Phosphoric „ Soda and potash Soluble salts.	0·0061	0·0052
Carbonate of lime	0·3141	0·2870
Magnesia.	0·0011	0·0013
Insoluble matters	0·6666	0·6927
Alumina and oxide iron	0·0086	0·0023
Matters dissolved in acid.		
Organic matters and water	0·0055	0·0058
	0·9970	0·9943

Let us first examine the analyses of the samples from the bay of Mont St. Michel. In them the substances which are most important are the silica and the carbonate of lime; and the nearer we approach the sea, the greater is the proportion of the silica; the farther we proceed from it, the greater is the proportion of carbonate of lime.

Now, if we examine the basins of the three rivers which discharge into this bay—the Sée, the Séline, and the Couesnon—we find that they are entirely without carbonate of lime. It is the same with all the shores of La Manche and Brittany; so that this enormous proportion can neither be supplied by the rivers nor by the shores. If the samples be examined with the microscope, beginning with those taken near the sea, and proceeding to those taken more inland, it is easy to recognise in the former distinct portions of shell; then these fragments diminish in size, and become so impalpable that the most powerful glass will not enable us to distinguish their form, although these particles are of the purest lime. It is thus evident that the calcarious portions of these deposits come from the sea, and even from the bottom of the bay of Cancale. As to the silica and clay, their presence may be partially attributed to the rivers; but then, it is important to observe, how very insignificant these three streams are, which in their ordinary state do not discharge more than from 300 to 360 cubic feet per second, when compared to the enormous volume of the flood wave, which is considered at equinoctial spring tides to be equal to 47,075,000,000 cubic feet, and in neap tides to 21,500,000,000 cubic feet, and which sweeps the bay twice in 24 hours. If the matters brought down by the rivers formed any important portion of the deposits of this locality, clayey or gravelly deposits would be observable upon their banks in those portions where the action of the tide ceases; but nothing of this kind occurs. The mixture of the calcarious matter, of the silicious grains, and of the clay, is so complete that it is evident this mixture must have been effected at the centre of production of the calcarious matter itself; that is to say, at the bottom of the sea. If the alluvion from the rivers were appreciable, it would counterbalance, either entirely or partially, the excess of the calcarious matters which are observable in the *tangues* collected in the higher parts of the roads, when compared with those collected in the lower parts. This is far from being the case, and instead thereof we find that, in proportion as the shore rises, the calcarious element, which can only come from the sea, increases. Lastly, if the fluvial alluvions were of any importance, we should find that the proportion of clay upon the banks of Sée, which traverses the schistous formations, would be greater than in the bay of Moidrey, near the Couesnon, which flows over rocks of a much harder nature, and furnishing much less clay than the soft schist of the basins of the Sée and of the Séline. The contrary, however, happens: the *tangues* of Moidrey are actually more argillaceous than those of the banks of the Sée and of the Séline, simply because the bay of Moidrey, being better sheltered than the beds of the other rivers, allows the sea to deposit, under more favourable conditions, the matters it holds in suspension, and deposits in such quantities in the basins of harbours.

We believe, therefore, that we are justified in saying that in the bay of Mont St. Michel the alluvions are exclusively marine; that the influence of the rivers upon the nature of these deposits is perfectly imperceptible; and that the matters which constitute them are derived from the bottom of the bay of Cancale, where they be-

come intermingled with the *débris* of the shell-fish which are found there in such enormous quantities.

If it be desired to arrive at some opinion upon the volume of the matters carried by the sea into this bay, the following observations may be of service:—Some archæological documents, which appear to be beyond dispute, carry back to the beginning of the 8th century the rupture of a *dune*, some traces of which may still be perceived on the opposite sides of this bay, and which formerly protected the rocks of St. Michel and Tombeleine, then existing in the midst of the marshes formed by the waters of these rivers. It is subsequently to the rupture of this *dune* that the sea has deposited the matters which now line its bottom. Now, by calculating the surface of the ground covered by the *tangue* on the upper side of this *dune*, and multiplying this surface by a mean thickness of five mètres, we find that about 600,000,000 mètres cube have been deposited in ten centuries, or 60,000,000 in a century, or 600,000 mètres cube in a year. Such is, as far as can be ascertained by calculations based upon archæological documents, the amount of matter brought by the sea into the bay of Mont St. Michel; but it must be observed, that in all these sheltered harbours upon the shores of the department of La Manche similar deposits take place. The principal of these are the bays of Lessay, La Rôque, and Isigny. Now we must observe that the neighbouring shore is far from being of a friable nature, and consists of a hard schist which does not corrode easily. If, then, the sea bring in such large quantities of matters upon solid shores, what must it do upon the coasts of the Calvados and the Seine Inférieure, which are unable to resist even the alternate actions of frost and thaw? We will endeavour shortly to appreciate in figures the volume of these matters; for the present, let us return to the Seine.

As the hills which enclose the course of this river are of a calcarious nature, we can form no opinion upon the origin of its alluvions from the mere fact of the presence of the salts of lime; but that which has been said with respect to the bay of Mont St. Michel, and more generally to all the western shore of the Channel, which is under precisely similar conditions, convinces us that in the depths of the sea a considerable trituration of sand and calcarious matters takes place; that the latter are furnished by the shells of the crustacea; that the whole of them are carried by the flood tide into all the roads, bays, and mouths of rivers, there to be deposited, if still-water should exist, or if any force should there be found to counterbalance the action of the flood tide. Let us see, by a discussion of the analyses previously given, whether we can find, if not palpable proofs, at least strong presumptions in favour of the belief of the maritime origin of the matters which are deposited at the mouth of the Seine.

If we compare the composition of the matters deposited in the port of Rouen with those deposited at Quillebœuf in front of the banks, and at Caudebec behind them and at their feet, we shall find that the deposits of Rouen are extremely muddy, and that they contain 22 per 100 of sand and 37 per 100 of lime. If we examine these deposits by a magnifying-glass after a number of decantations, in order to remove the pure clay, we discover the elements of shells as in the case of the *tangue*, which is of an exclusively marine origin. Doubtlessly it may be a matter of question whether these elements of shells be maritime, and even whether all the calcarious matters be derived from shells; but, if we compare the proportions of this calcarious matter with those of the bay of Mont St. Michel; if we recollect that friable soft marls in a comminuted state cannot long resist the dissolving action of water containing strong doses of carbonic acid; if, lastly, we observe that the secretion of lime by fresh-water crustacea bears a feeble proportion to that which takes place at sea; we may assert that there is at least a strong presumption of the marine origin of the calcarious matter contained in the mud of the port of Rouen.

We would also observe that the small quantity of sand appears to us also to be brought in from the sea; for with these sands argillaceous matters of excessive fineness are deposited—mud, in fact, properly so speaking, or substances which have about the density of water and a specific gravity far less than that of the finest sands. These muds are brought partly from above and partly from below. On examination of the deposit left upon filters by the Seine waters, we find nothing but earths—not sands. Now, the earths could not come down from the uplands without successively purifying themselves from all the heavier matters which the water brought forward with them, according to the law of their densities. Thence, as the Seine below Rouen carries forward mud, it is above Rouen—or, at lowest, at Rouen itself—that the last deposits of the silicious materials removed by the waters must take place; and the waters, after purifying themselves by the effect of the small inclination and the reflux, must continue their course laden only by some light muds. It is known that at Paris the sands are granular and pure; at St. Pierre de Vauvray sandy deposits take place, which are removed by the dredging-machine; whilst between Pont de l'Arche and Oissel, and between Oissel and Rouen, nothing but mud is to be found.

Let us now examine the composition of the banks in the *embouchure* of the Seine. We find that those which are not removed from the action of the flood and ebb tides are composed of 0·81 of sand and 0·15 of carbonate of lime. The sand is exclusively a marine product, as we have already shown; the carbonate of lime is so likewise, for if these sands be examined by the glass we shall find in them the elements of shells; so that it is proved that 96 per 100 of these sands are of marine origin. The analysis shows that there is 3 per 100 of water of combination; the remainder is iron, which occurs in greater proportions in sea than in river waters. Thus, to these deposits the rivers bring little or no addition.

With respect to the deposits which take place behind the banks entirely protected from the flood tide, but at the base of these alluvions, we find that they contain 62 per 100 of quartzose sand, 3 per 100 of peroxide of iron, and 6 per 100 of water of combination—that is to say, 71 per 100 of matters different from those brought down by the river; moreover, there is 28 per cent. of carbonate of lime. In this case, the magnifying-glass no longer enables us to recognise the form of the shells, and we might suppose that the carbonate of lime was as likely to be brought from above as from below; but, if this carbonate of lime were brought from above, it would not be deposited without clay—the only matters which the waters of the Seine contain after passing Rouen. As there is no clay, we may conclude that these deposits also are marine.

There remains, then, the upper part of the deposits, which contains the grassy soil—a matter containing clay and lime intimately mixed; but in the inner harbours of sea-ports, free from the alluvial deposits of rivers, as at Dieppe, similar argillaceous deposits take place. These deposits of grassy soil, then, may be strongly suspected to be of marine origin, like the others; and, if the river should have contributed to form them, it is only by these matters it brings into the immense basin of the Channel, where their imperceptible particles are overwhelmed in the immeasurably greater quantities of similar matters already existing.

Lastly, as all the banks which constituted the alluvial deposits of the Lower Seine, previously to the formation of the embankments, contained similar substances to those of the banks at Quillebœuf, and behind the banks of Caudebec, which we have shown to be of marine origin, we are entitled to assert that the alluvions brought by the Seine to the bar at its mouth are not worthy of being taken into account.

(*To be continued.*)

THE RECENT VISIT OF JUDGE LYNCH TO THE CITY GAS-WORKS.

By L. Thompson, Esq.

"*Dicere verum—quid vetat?*"—Hor.

A Quaker, of an artificially meek disposition, was once much startled by the sudden barking of an unfortunate cur; and, feeling the impropriety of an outward display of his sentiments, he very considerately exclaimed, "I will not revenge upon thee by hurting thee, but I will give thee a bad name!" whereat, screaming forth "Mad dog! Mad dog!" he soon collected together a crowd of brainless brutes, who, with sticks and stones, despatched the poor unoffending animal to his long home without mercy. The same thing is going on now as regards the City Gas Company, which may be said to represent the above unlucky "dog," whilst the Court of Sewers *is positively* the "crowd of brainless brutes"—the police and press being "the sticks and stones;" and "the Quaker" is——But I must not say who the Quaker is. Some people imagine Mr. Charles Pearson has an interest in the Great Central Gas Scheme over and above the very natural interest he takes in the success of this object of his own creation; as if Mr. Pearson would accept anything like £12,000, or 1½d. per 1000 cubic feet for his patriotic exertions in the illuminating line! Now, I happen to draw my authority, as usual, from the fountain head—that is, from Mr. Pearson himself—and I tell it in that gentleman's own words, when I say that he merely "planted a tree" on the occasion in question, and has no other interest in the matter. Whether the "tree" was an apple tree—and if so, whether it was a "golden pippin," and has yielded close upon "12,000 golden pippins" since it was planted—Mr. Pearson has not yet informed me; but no person has any right to doubt the truth of the above statement upon his authority.

To return, however, to the subject of the City Gas Company, together with Mr. John S. Hodgson, superintendent of police—a "stick" or "stave" of no common magnitude. There are few things in natural philosophy so striking as the resemblance occasionally shown betwixt men with particular dispositions and the inferior animals endowed with those dispositions. Thus, a crafty and cunning fellow will have the face of the fox, whilst one with a rude and brutal temper is found to resemble the bear. Although, therefore, I have never seen Mr. Superintendent John S. Hodgson in my life, yet that he is very like a jackal I have no doubt whatever. In the first place, a policeman is, at best, only a kind of hangman's jackal; and, in the second place, Mr. Hodgson has a nose and a scent that even his prototype might envy. So exquisite, indeed, are his *nose*ological endowments, that I fear he runs some risk of incurring the fate depicted in the well-known line—

Die of a rose, in aromatic pain.

Some men are said to have been born for the positions they occupy, and assuredly Mr. Hodgson is of that lucky number; he might fairly have claimed the office he now holds the moment he "popped his nose" into the world. Compared with *his* nasal capabilities, how insignificant become the boasted delights of the extatic snuff-taker!—

Knows he who never sniffed tabac,
Nosey! the pleasure thence that flows,
Nosey! the titillating joys,
Which my nose knows?
Oh! nose, I am as proud of thee
As any mountain of its snows;
I gaze on thee, and feel that joy—
A Roman nose!

Why, this man's nose must have been an expense to him—a costly encumbrance; whereas Mr. Hodgson can not only equal him in "making the most of a smell," but is so well "up to a pinch of snuff," that he makes money also by it. True, he suffers severely from the odoriferous duties of his office: he is sick! he is faint! he falls to the ground! he—no, he doesn't die; he makes "a report!" Only imagine Mr. Superintendent Hodgson sick, and prostrate on the ground, in the neighbourhood of Whitefriars! conceive the varied opinions of the spectators as to the cause of the phenomenon, or the opinion which Mr. Superintendent himself would form by seeing any other person in the same "incapable" condition; then let a little light be thrown upon the matter, sufficient to enable any one to read—

"That though he did seem in a fit,
'Twas nothing but a 'feint.'"

Allow me, however, to point out to Mr. Hodgson and his officers, that it is possible to prove too much. The celebrated Dean Swift once ordered his cook to take an over-roasted leg of mutton down again into the kitchen, and "under-do" it; but, being informed that this was impossible, he advised her "never afterwards to commit a fault which she could not remedy." There is a moral in this which even a policeman may benefit by. Only suppose (horrible thought!) that these nasal peculiarities of the City police should happen to be divulged at one of Mr. Mayhew's East-end *soirées*, and that every rogue in the metropolis got to know how easily Mr. Superintendent Hodgson and his "merry men all" might be laid prostrate in a moment by the opening of a phial of "gas liquor," where would be our security, or what would it avail to cry, "Police! Police!!" when each member of the "force" was helplessly stretched upon the pavement, and looking bluer than his official integuments, from a mere whiff of that "deadly poison," Gulielmus Ceruleus, or "Blue Billy?" Then, again, should intelligence of this fact reach the ears of Mr. Ernest Jones, what resistance can we offer if that furious Chartist, taking advantage of the wind, pours out the "phials of his wrath" upon Primrose Hill, in the shape of a gallon of ammoniacal liquor?—a kind of olfactory "*feu d'enfer.*'

Can Mr. Superintendent Hodgson not foresee the disadvantage to the public service of a morbid sensibility of the nerves, or does he now begin to "scent" the value of Dean Swift's admonition? I fear his peculiar idiosyncracy will require his speedy retirement from office, for which he has evidently no stomach, if he speaks the truth. And now, with regard to the report of the medical officer, what shall I say? Exactly what Mr. Burchell exclaimed to the interesting communications of Miss Carolina Amelia Wilhelmina Skeggs—"Fudge!" said Mr. Burchell. The medical officer asks, "Is the heart of a crowded city a proper locality for conducting a business which is admitted to be injurious to the public health?" I answer, that gas-making has never been admitted to be injurious to the public health; and, during the forty years of its continuation in this country, it has not been known to give rise to any form of disease amongst the workmen engaged in it, nor to have aggravated any form of disease under which they might labour from other causes. I speak this as a thoroughly qualified medical man of many years' experience, and I challenge the medical officer of the City of London (who is not a thoroughly qualified medical man) to show the contrary.

That immaculate periodical, the *Times*, has, of course, launched forth its "sparks" upon this occasion, by way of having a last kick at "the lame dog." Those who know that Mr. Delane, the editor of the *Times*, is the son of Mr. Delane the Great Central director, and who also know that "blood is thicker than water," will not require me, in the language of Sir James Graham, to tell "the reason why."

With this, for the present, I conclude, although I am very far from concluding with my subject.

London, Sept. 25, 1856.

Register of New Patents.

608.—Joseph Sturge, of Kennington, and Alfred Sturge, of Northfleet, for "*An improvement in rotatory fluid meters.*" Patent dated March 13, 1856.

This invention consists, first, in adapting a modification of a screw in such a manner that its revolution on its axis shall be the measure of the quantity of fluid passing through a tube or case. Secondly, in so forming the tube or case that the fluid shall pass in straight, or nearly straight, lines through it, causing the revolutions of the screw vanes to be a correct measure of the quantity of fluid passing. One or more vanes are attached to a spindle, forming a portion of a screw of one or more threads; and the spindle to which these vanes are attached is placed perpendicularly in a cylindrical case, rather larger in diameter than the diameter of the screw, the lower end of the spindle resting upon a centre, upon which it freely turns, and the other end passing through the top of the case, and is furnished with a worm for communicating motion to the dials. The upper end of the spindle is furnished either with a collar, which works against the top of the case, or with a centre at the extreme end of the spindle; the last-named method being preferred. The screw can be made by casting the whole of the mettle in a mould properly struck, or by stamping each separate vane in a disc or discs, and afterwards connecting them to the spindle by means of a metal boss, or central block cast on to them, or by any other method of forming a perfect screw. It consists of a cylinder, into the upper and lower end of which is introduced a perforated plate or grating. A centre of metal or other suitable hard material, for the spindle to revolve upon, is fixed either to the lower perforated plate or grating, or to the bottom cover of the cylinder. The upper plate or grating, as also the top of the cylinder, has a hole in the centre to allow the spindle to pass freely through it. The worm or the spindle, and the work immediately connected, are covered by a close-fitting cap or cover, which can be filled with oil, and on the top of which are affixed the dials for registering the quantity of fluid passing through the meter. The fluid is admitted underneath the lower perforated plate or grating, and ascends through the upper plate or grating; and whatever motion the fluid may have, is changed into a perpendicular motion by passing through the perforated plate or grating.

The claims are for—

1. Its simplicity and comparative freedom from derangements.
2. The small wear and tear; the working parts being extremely light, and the weight of the vanes and spindle being in most cases balanced by the ascending column of fluid.
3. The action being independent of the amount of pressure, and not dependent upon individual adjustment, no wearing of the parts can sensibly affect the registration of the quantity of fluid passing.
4. The diminished cost of the instrument.

634.—George Hills, of Belmont Hill, Lee, in the co. of Kent, for "*Improvements in treating fatty and oily substances, so as to obtain stearine and oleine in separate states.*" Patent dated March 17, 1856.

This improvement consists in treating oily and fatty substances as follows: The tallow, cocoa-nut oil, or other substance to be operated upon for the purpose of separating the oleine from the stearine therein contained, is to be melted, in any convenient kind of vessel, at a heat of 110° Fahrenheit. To 100 parts of the oily or fatty substances are to be added 10 parts of dry sulphate of lime, or dry chloride of calcium in powders (or other suitable substance capable of absorbing water from liquid muriatic, or nitric acid), and well mixed with the fatty matters. To every 100 pounds of the fatty materials, five pounds of muriatic acid, of the specific gravity 1·170, or five pounds of nitric acid, are to be added, and the whole to be well agitated together for an hour. Water is then to be added, and heated to the boiling point, by steam or otherwise, until the muriatic acid is all absorbed from the fatty materials. The mixture is then allowed to settle, after which the tallow, or other fatty material, is to be run off into shallow vessels to cool. If any water remains mixed with the fatty materials, the materials are melted again at a temperature of 180° Fahrenheit, and again allowed to cool; and when they have been brought down to the temperature of 75° or 80°, according to the quality in hardness of the stearine required, the materials are pressed in the usual way of pressing stearic acid, when the oleine will run off and leave the stearine, which may at once be made into candles. Instead of adding liquid muriatic acid or nitric acid to the mixture of fatty materials with the dry sulphate of lime or orther equivalent material, a stream of muriatic acid gas or nitric acid gas may be passed through the fatty materials, which may be mixed or not with dry sulphate of lime, or other equivalent material, and is then to be treated in the same manner as if liquid muriatic acid or liquid nitric acid had been employed, as hereinbefore described.

The patentee does not limit himself to these exact details and proportions, which he says may be varied without departing from the nature of his invention.

The claim is—

1. For the purpose of separating the oleine from the stearine of fatty and oily matters; the employment of liquid muriatic or liquid nitric acid in conjunction with dry sulphate of lime, or dry chloride of calcium (or other substance capable of absorbing water from either of the above-named acids, as hereinbefore described.
2. For the above-named purpose, the employment of streams of muriatic acid gas, or nitric acid gas, whether in conjunction or not with dry sulphate of lime, or other equivalent material, as hereinbefore described.

PROVISIONAL PROTECTION

HAS BEEN GRANTED FOR THE UNDERMENTIONED PATENTS.

2009.—Jean Baptiste Feauveau, and Louis Alexander Legrand, both of Brussels, for "*An improved apparatus for the purification and the combustion of gas.*" Aug. 28, 1856.

2017.—Armand Louis Andrée Herbelot, mechanician, for "*Improvements in obtaining motive power by gases or fluids.*" Aug. 30, 1856.

2047.—John Roberts, of Upror, in the co. of Kent, terra cotta manufacturer, for "*An improvement in the stoppering and closing of jars, bottles, and other vessels; applicable also to the joining of earthenware and other pipes.*" Sept. 3, 1856.

2058.—George Anderson, of Queen's Road, Dalston, in the co. of Middlesex, gas engineer, for "*Improvements in the combustion of tar, and other similar matters, in heating gas retorts, and in the consumption of smoke arising therefrom, and from other fuels used therewith.*" Sept. 4, 1856.

2087.—Felix Estivant, in the name of the Society Estivant, brothers, of Paris, and of 45, Essex Street, London, for "*Improvements in casting metallic tubes.*" Sept. 8, 1856.

2115.—Stephen White, of Newland's Street, Everton, Liverpool, in the co. of Lancaster, gentleman, for "*An improved method and apparatus for the distillation of certain oils or oily substances from the petroleum commonly called 'earth oil,' found in certain districts in the Birman Empire, and an improved method of purifying the oils or oily substances so obtained.*" Sept. 10, 1856.

2136.—Henry Dubs, of the Vulcan Foundry, Warrington, in the co. of

Lancaster, engineer, and JOSIAH EVANS, of Haydock, in the same co., engineer, for "*Improvements in slide valves.*" Sept. 12, 1856.

2140.—JOHN ELLIOTT, of Southampton, in the co. of Hants, architect and civil engineer, for "*An improved apparatus for containing and supplying water, gas, and other fluids; applicable, also, to a fluid meter.*" Sept. 12, 1856.

2167.—JOHN ELLIOTT, of Southampton, in the co. of Hants, architect and civil engineer, for "*An improvement in taps and cocks.*" Sept. 16, 1856.

2179.—FRIEDRICH HEINRICH RUDOLF SCHELLER, of Vienna, Austria, chemist, for "*An improvement in the manufacture of illuminating gas.*" Sept. 17, 1856.

NOTICES HAVE BEEN GIVEN OF INTENTION TO PROCEED WITH THE UNDERMENTIONED PATENTS.

1572.—ROBERT LUKE HOWARD, of 85, Whitecross Street, London, engineer, for "*Improvements in valves for regulating the flow of liquids.*" July, 4, 1856.

1607.—ROBERT MARTINEAU, of Birmingham, in the co. of Warwick, manufacturer, for "*Improvements in taps for drawing off liquids.*" July 8, 1856.

1815.—THOMAS WIKSTEED, of Coleman Street, in the City of London, civil engineer, for "*Improvements in separating sewerage and other matters from water or fluid mixed therewith.*" July 31, 1856.

1875.—WILLIAM WEBSTER, of 22, Bunhill Row, London, for "*An improved valve-cock.*" Aug. 9, 1856.

Miscellaneous News.

THE METROPOLITAN BOARD OF WORKS.

FRIDAY, SEPTEMBER 26.

The Board met at Guildhall this day at twelve o'clock—Mr. THWAITES in the chair.

The minutes of the last meeting having been read and approved,

The CHAIRMAN called attention to the present state of public business, and the arrangements which, in his judgment, were necessary to secure its despatch. The engineer's report upon the main drainage was now ready, and would be presented that day, so that the members of the board might proceed with the discussion without further delay. There was also the question of the projected new streets in Southwark and the district of Covent Garden, which must be taken up at an early period, so as to enable them to give the necessary parliamentary notices this autumn. He suggested, therefore, that it would be desirable to hold three board meetings during the ensuing week, so as to dispose of these matters, as well as the ordinary business devolving upon them. He was fully conscious of the sacrifice which it was calling upon members to make for the public service; but perhaps, under the circumstances, and taking into account the vacation they had had, it would not be deemed too much.

Mr. H. L. TAYLOR considered that the chairman had done perfectly right in calling the attention of the board to the subject, but he did not agree with the suggestion to hold three meetings in one week. All the members had private business to attend to, and the majority of them other public duties than those connected with the board; and, as they would all desire to be present during the important discussions referred to, it would be most convenient not to increase the number of meetings beyond two. He submitted a motion to that effect.

Mr. NICHOLAY seconded the motion, as he felt persuaded that it would be impossible to do full justice to so many and such great questions if the meetings of the board were too numerous.

After a few observations from Messrs. Howes, Leslie, and Harrison, it was resolved to leave the matter in the hands of the chairman, Wednesday next being fixed upon for the discussion of the engineer's report on the main drainage.

The board then proceeded to hear and consider the statements of Mr. G. J. Wigley, architect, and Mr. W. C. Stow, district surveyor, as to whether a building to be erected for the purpose of a private female community at Peckham, was to be considered a public or a private building.

Mr. STOW stated that he had inspected the drawings, and made himself thoroughly acquainted with the distribution of the apartments in the proposed building, which was intended for a convent, to accommodate sixty inmates; and, if the board should be of opinion that it was not a public building within the meaning of the act of Parliament, he had no reason to object to the mode of construction. His own opinion was, that it was a public building; and, as he differed therein with the architect, they had mutually agreed to refer it for the decision of the board.

Mr. WIGLEY contended that the construction put upon the clause in the act of Parliament by the district surveyor was too wide and extensive. The proposed building was only a private ladies' school, and could not, therefore, be included in the terms, a "place of public instruction;" in fact, there was no room in it for any but the community intended to be lodged within its walls. A free school for pauper children was contemplated in connection with it; but, if such a use of the building would bring it within the definition, that purpose would be abandoned. The chapel attached to the building would only accommodate the residents in the establishment.

A number of questions having been proposed and answered, the clerk's opinion was asked for by Mr. Dennis.

Mr. WOOLRYCH said he considered that the building, as described in the application to the board, and as further explained by the gentlemen present, was not a "public building." The definition of a public building was given in the second clause of the Metropolis Building Act, and it was in these terms:—"Public building shall mean every building used as a church, chapel, or other place of public worship, or for purposes of public instruction, or as a college, public hall, hospital, theatre, public concert-room, public ball-room, public lecture-room, public exhibition-room, or for any other public purposes;" and it was apparent that the word "public" was used in two senses; first, in the case of the building being open to the public; and secondly, as being supported by funds contributed by the public. It was important to observe that the general words, "for purposes of public instruction," preceded a number of particular things such as, "public lecture-room," "public concert-room, &c.;" and the vagueness and obscurity which had arisen in this case was attributable to these general terms preceding a number of particular ones. Looking, however, to the old Building Act, to see whether any light could be thrown upon the subject, he found these words employed:—"A building originally used as a chapel, &c., or for any other similar purposes, or for the assemblage of persons in large numbers, whether for public worship, business, instruction, or resort." Now it could not be said that "large assemblages of persons" were likely to resort here for the purposes of public instruction, as it was described as a building intended to receive sixty persons, thirty being in-door boarders, and thirty having some other place of residence. True, it was said that in the basement was to be a room for the instruction of pauper children; but here again a limitation was prescribed by the size of the room itself, which was only 23 feet by 15, or about the dimensions of an ordinary-sized dining-room. Looking, therefore, at the facts of the case, and the evident intention of the Legislature, he was of opinion that this was not a public building within the meaning of the act of Parliament.

On the motion of Mr. CRELLIN, seconded by Mr. WRIGHT, a resolution in conformity with the opinion expressed by the clerk was then almost unanimously adopted.

Reports on the state of the collections of district sewers' rates for August, 1856—on the state of collections of charges for default, and improvement rates for the same period—and on collections of the district sewers' rates in different districts—were then brought up and disposed of, and a number of warrants ordered to issue against defaulters.

OFFICES OF THE BOARD.

The CLERK then read the report of the committee on the site of offices, presented on the 6th of June, recommending that advertisements for suitable premises for the offices of the board be inserted in the public newspapers.

Deputy HARRISON moved, and Mr. CRELLIN seconded, the adoption of the report.

Mr. H. L. TAYLOR objected to the recommendation. There was property in the City of London in a central part, and eligible for the purposes of the board. If the matter were referred to some other committee, there would be no difficulty in coming at once to a decision.

Mr. TURNER: Do you allude to the site of the Fleet Prison?

Mr. TAYLOR. No—I do not. There is ground that can be obtained which does not belong to the corporation.

Mr. WRIGHT said, the best mode of dealing with this question, seeing it had been so fully discussed at a previous meeting, was to give a simple negative to it. The recommendation was so absurd, that he could not understand why the committee brought it forward again.

Mr. NICHOLAY was opposed to the recommendation, but he thought that the matter ought to be discussed, as the committee were pretty equally divided upon the subject.

M. SEELEY said that, though the committee were equally divided, no delay had been caused thereby. For his own part, he cared not at all whether the board agreed to or rejected the recommendation, as, since it was made, a site in the City had been placed in the market, for which arrangements could be made at once, if required.

Mr. LESLIE opposed the motion, and reiterated his former objections to a removal from Greek Street. The board had there a spacious freehold capable of being accommodated to all their wants, and which had been acquired at enormous cost to the West-end ratepayers. That spot, he contended, was as central as could be desired; and, on the score of judicious economy, he would always protest against its being sacrificed to the fanciful designs of certain members of the board. They had not yet settled the great drainage question, and that would, to a great extent, determine the amount of office-room that would be required; but he believed the site at Greek Street was capable of all the necessary alterations that could be required for their offices.

Mr. DENNIS said he would be no party to advertising for a site, as he believed that in Greek Street they could find all that they needed, and on the first occasion of the subject being brought up the board almost unanimously resolved to remain there.

Mr. D'IFFANGER, referring to the estimates which had been prepared to show the probable amount required to be raised from the ratepayers, opposed the large additional expense which would be incurred if the board erected new offices.

Mr. Collinson, Mr. Hawkes, and Mr. Hows also opposed, and Mr. Few supported, the motion.

Deputy HARRISON then briefly replied. He said the committee, in making this recommendation, had simply done what the board had desired them to do, and he thought they ought to be supported in it.

On a division, there appeared 16 on each side, and the chairman gave his casting vote in favour of the adoption of the report.

BUILDING PROJECTIONS.

The CLERK read a report of the committee on the duties of the board under the Building Act, recommending that the letter submitted to the committee, relative to the projections beyond the regular line of frontage, be approvede and that a copy thereof be forwarded to each of the district surveyors of the metropolis. The letter was as follows:—

Sir,—I am directed by the Metropolitan Board of Works to acquaint you, with reference to the verification of plans to accompany applications to this board for consent, under the 143rd section of the Metropolis Local Management Act, to erect buildings in advance of the regular line of fronts in streets, and applications to this board under the 26th section of the Metropolitan Building Act, that the board have passed an order directing that the duty of verifying such plans should be attended to by a surveyor attached to the department of the superintending architect, and that you will not, for the future, be required to perform such services.

The board consider it of importance that the district surveyors of the metropolis should be apprised of the interpretation which they put upon the expressions, "The general line of fronts in any streets," under the Building Act, and the "regular line of buildings," under the Local Management Act: the board regard these terms as implying the line of houses in the street as originally designed and built, without reference to subsequent additions, or so far as built when these acts came into operation. The consent of this board is necessary whenever any builder or owner proposes to bring forward any building from the main wall or front of a house, although many such buildings may have been carried out in the length of the street, or any division of it; and the board are extremely desirous of maintaining and improving all streets and thoroughfares, and preventing encroachments on present widths.

To give effect to their endeavours to preserve the main lines of buildings, they rely upon the active co-operation of the various district surveyors of the metropolis; and they deem it essential that, in all cases which come under their observation, they should inform the builders and others wishing to build on forecourts and vacant spaces, that they must obtain the consent of this board before they can be permitted to proceed with the works, and by calling the attention of the board to any cases in which their warning in this respect may have been disregarded.

It may be convenient to add, that in certain districts of the metropolis there are local acts still in force, which will be found serviceable in preserving lines of frontage and preventing unauthorised projections.

On the motion of Mr. TURNER, seconded by Mr. FEW, the consideration of the subject was postponed till the clerk's opinion as to whether such a letter is in conformity with the act of Parliament is obtained. In the course of the discussion that ensued upon it,

Mr. PASCALL said, numerous applications had been made to the board by parties desirous of building shops upon the forecourts of houses, and in some of these cases the board, having a regard to the public interests, had refused their consent; but it had come to his knowledge that, in open defiance of such decisions, buildings had been commenced and completed. He felt assured that, if anything could help to bring a public body like the Metropolitan Board of Works into contempt, it was the enactment of certain rules and regulations which they had not the power or the energy to see carried

into effect. He mentioned the matter that the attention of the superintending architect might be directed to it.

Mr. MARRABLE stated that one case, to which the honourable member had specially referred, had been brought under his notice that day by the district surveyor of Clerkenwell.

Mr. PASCALL thought that, when an order of this board prohibiting such projections was made, the district surveyor ought to inform the parties that the work must not be proceeded with; and, if they transgressed, to summons them at once before a magistrate under the 45th and 46th sections of the act of Parliament. The honourable member mentioned two or three other cases in which similar infringements of the orders of the board were being carried on.

The CHAIRMAN: Have the vestry of Clerkenwell taken any steps in the matter?

Mr. PASCALL said the vestry had addressed a letter to the Metropolitan Board to know whether permission to erect such projections had been granted; and, finding that it had not, they wished to know whether they would be justified in pulling them down. To this they had received no reply; and they considered that, if the board felt no interest in seeing their own orders obeyed, it was not for the district to interfere.

The CHAIRMAN said it was a very delicate matter for the clerk to this board to take upon himself to give an opinion as to what a vestry or district board ought to do in such a case. It was quite sufficient for the clerk to intimate that the Metropolitan Board had not given its assent to the erection, and then the act of Parliament pointed out the proper course to be adopted.

Mr. PASCALL said the power given to the vestry to pull down such irregular projections was only a permissive one.

Mr. H. L. TAYLOR: But that is quite enough to justify them in taking action.

The CLERK said, the proceedings directed to be taken by the district surveyors under the 45th section of the Building Act, applied to the particular buildings included in that act; and, no doubt, if a builder offended by proceeding without consent, proceedings could be taken against him before a magistrate; but that did not apply to questions arising under the 143rd section of the Metropolis Local Management Act. In the latter cases, where permission was not given, it was for the vestry or district board, on their own motion, to take proceedings or to withhold them.

The CHAIRMAN: We have no power to compel the vestry to pull them down.

Mr. PASCALL: But you have power over the district surveyor.

Mr. HOWS said the vestry which he represented had stepped in, as the act directed in the 143rd section, and empowered their surveyor to pull down an irregular projection; and the consequence was, that the parties had instituted legal proceedings against their officer.

Mr. MARRABLE said that, in the letter which he had referred to, the district surveyor of Clerkenwell stated that he was prepared to carry the case complained of by Mr. Pascall before a magistrate, for his decision thereon.

FINANCE.

Mr. DALTON brought up a report from the finance committee, recommending that that part of the resolution of the board of the 8th of Februry, 1856 (No. 2), directing "that drafts for payment of moneys signed at a board meeting be countersigned by the clerk and accountant, and lastly by the chairman, on his delivering the same to the party entitled to receive the same," be varied, by adding the following words, viz.:—" or (in the case of cheques drawn for a gross amount, to be afterwards distributed in smaller ums among sluice-keepers, collectors, and other officers) to the accountant, on his endorsing such cheque:" reporting, that they have considered the letters presented to the board on the 12th of September inst., from Messrs. Brooks, Benson, and Warnett, employed in the late Metropolitan Buildings' Office, in reference to the payment of compensation awarded for the loss of their offices, and a similar communication from Mr. Lower; that they recommend the amounts due up to Michaelmas next for payment, and have included the same in the list of payments to be submitted to the board; recommending that the sums specified in the statement submitted to the committee, amounting in the whole to £11,766. 10s. 8d., be paid; and recommending that the sum of £10,000 be removed from the deposit account, and placed to the current account of the board.

Mr. WRIGHT called the attention of the board to the delay which had taken place in the issuing of a precept for a sewers' rate.

The CHAIRMAN explained the cause of the delay, and stated that the matter would most probably be ripe for deliberation at the next meeting of the board.

The report was then adopted.

THE RANELAGH SEWER.

The board proceeded to consider a report from the engineer on a letter from the Paddington vestry, complaining of damage to houses in Gloucester Terrace by overflow and flooding from the Ranelagh sewer, and to receive a report from the clerk as to whether any arrangement has been entered into with the Government in reference to the height of the weir, or storm overflow, into the Serpentine. It was resolved, after considerable discussion, that it was advisable not to make any alteration in the height of the weir.

Mr. Bazalgette's report on complaint of Mr. Dolman and others of the flooding of houses by the insufficiency of the sewer in the Pembroke Road, Kensington, and upon the proposed construction of a brick sewer in lieu of the existing 18-inch pipe sewer in that locality, was again brought up. At the last meeting of the board it was referred back to the engineer to consider whether any, and what portion, of the expense of constructing the new sewer should be borne by the owners of property in the neighbourhood. Mr. Bazalgette now stated the circumstances under which the pipe sewer was originally laid down, and the amount of drainage which it was now required to carry off; expressing his opinion that, as it embraced the sewerage of some two thousand houses, and about six hundred acres of ground, no part of the cost could be fairly charged upon the owners of property immediately adjoining, it being the construction of a main line of sewer, and a substitution for a defective one. The length of the proposed work was 2900 feet, and the cost £4100.

Mr. HAWKES, though regretting the necessity for so large an outlay, felt the vast importance of the work being at once proceeded with, and therefore moved the adoption of the engineer's report.

Mr. DIXON seconded the motion.

Mr. HAWKES asked whether the opinion of the Attorney-General, as to the mode of apportioning the payment of such works, had been obtained?

The CLERK said it had, and was to the effect that the cost should be defrayed by the district.

Mr. LESLIE inquired of the engineer whether the whole of the 2900 feet of pipe sewer had failed.

Mr. BAZALGETTE said it was impossible to state positively without taking up the whole line of sewer, and to do that would be almost as expensive as the construction of the new sewer. The condition of the pipes, however, was not the whole question. Originally they were only intended to take the sewerage in dry weather; the storm-waters being carried off by means of an open ditch, which was continually being filled up, and was in itself a nuisance. His own belief was that many of the pipes were broken, and from time to time would be found to give way, and be a cause of expense to the board. The only effectual remedy was the one that he had proposed.

Mr. LESLIE said he had prepared a mass of interesting information on the subject of this sewer; but, as the representative of the vestry was prepared to have the proposed work executed, it would perhaps be inconvenient to go into it.

The motion was then adopted.

MAIN DRAINAGE OF THE METROPOLIS.

Mr. BAZALGETTE then read the following

REPORT:—

To the Metropolitan Board of Works, on the whole question of the Northern and Southern Drainage, with comparative Estimates of different Points of Outfall, and Modes of disposing of the Sewerage.

Extract from the Minutes of the Board, August 12, 1856.

"That the report of the engineer be referred back to him, in order that he may report to the board on the whole question of the northern and southern drainage of the metropolis."

Engineer's Department, No. 1, *Greek Street, Soho Square, September* 25, 1856.

Mr. Chairman and Gentlemen,—In reviewing the whole of this subject as it now stands before the board, it appears that the efficiency of the more complicated and important portion of the system of sewers adopted by the bord, and designed to spread over the metropolis, to provide for extended local drainage, to improve the existing defective sewers, and to intercept their sewerage, remains unquestioned. Indeed, the lines and levels of the proposed sewers are so interwoven with the numerous existing metropolitan works, that it would be impossible materially to alter the design without considerable disadvantage.

The necessity for sewers for improved drainage and the collection of sewerage, terminates at the eastern suburb of London, or about the Geenwich and West Ham Marshes. The sewers and works proposed beyond these limits are not designed to improve the metropolitan drainage, but their object is the purification of the Thames below Greenwich, or the application of sewerage to agricultural purposes.

The main question, therefore, respecting the drainage within the metropolis, may be regarded as having been already determined by the board.

The approved metropolitan drainage scheme is capable, without any material alteration of design, of being adapted to a variety of points of outfall into the Thames, at various distances below London, or to the deodorisation or utilisation of sewerage. Although the sewerage of London cannot at present be profitably applied to agriculture in a commercial point of view, it may be advantageously deodorised and rendered inoffensive at Barking Creek and Woolwich Marshes, or even nearer to London, and the Thames thus purified at less cost than by constructing sewers to a great distance below the metropolis.

I am still of opinion that, in the absence of deodorising works, the sewerage may be discharged into the Thames, without nuisance, at Halfway Reach, beyond the limits of the metropolis, in the manner already proposed for the south side of the Thames.

Various propositions have, however, been made with regard to the position of the outfall and mode of discharge into the river, and with respect to the application of the sewerage to agriculture. I shall now, therefore, endeavour to lay before the board some facts and estimates, to enable it the more fully to consider and compare the merits of the different propositions, and to draw its own conclusions respecting them.

There appear to be four different modes by which the metropolitan sewerage may be disposed of.

1. By retaining the points of outfall originally proposed at Barking Creek and Woolwich Marshes (marked A on plan), but dispensing with the reservoirs at those places, and substituting for them deodorising works, and discharging the purified waters into the Thames at all times of the tide, after having abstracted from them the deodorised manure, which would be available for agricultural purposes.

2. By discharging the sewerage into the river at Halfway Reach (marked B on plan), beyond the limits of the metropolis, at and near high water, so that it should not reflow up the river within the limits of the metropolis, excepting on occasions of heavy storms, which occur on from twenty to thirty days per annum, and last for short periods only on those exceptional days, on which occasions the sewerage would be highly diluted.

3. By discharging the sewerage into the river at Long Reach (marked C on plan) during the first half of the ebb tide, reducing the capacity of the reservoirs, and preventing the reflow of the sewerage into the river within the limits of the metropolis.

4. By conveying the sewerage on the south side of the Thames underneath that river to the north side, and discharging it at Sea Reach (marked D on plan) at all times of tide, so that it would not return within the limits of the metropolis, and dispensing with reservoirs; or by occasionally distributing such sewerage, or any portion thereof, as liquid manure over the lands or marshes through which it would be conveyed on its route to this outfall.

In comparing the foregoing propositions, the expenditure forms an important feature; and I submit estimates of the first cost and probable annual working expenses of each system, having capitalised the latter, at 5 per cent., in order to obtain a more correct view.

I am indebted to Mr. Thomas Wicksteed for the estimates for the deodorising works, which are founded upon his experience at the sewerage works at Leicester.

COMPARATIVE ESTIMATES.

	Estimate of Cost of Construction.	Probable Working Expenses	Working Expenses capitalised at 5 p. Ct.	Total Expenditure represented as Capital.
	£	£	£	£
Main drainage, as originally designed, to Barking Creek and Plumstead Marshes (A on plan)	2,407,276	27,390	547,800	2,955,076
Ditto, without sewerage works, extended to Halfway Reach (B on plan)	2,733,606	28,330	566,600	3,300,206
Ditto, extended to Long Reach (C on plan)	3,082,136	39,550	791,000	3,873,136
Ditto, extended to Sea Reach (D on plan)	3,844,300	43,705	874,100	4,718,400
Deodorising works added at the Barking and Woolwich outfalls, at A on plan	2,528,556	85,000	1,700,000	4,228,556

Thus it appears that the extension to Halfway Reach involves an increased expenditure of £345,130; to Long Reach, £918,060; to Sea Reach, £1,763,324; and the addition of deodorising works to the original scheme, £1,273,480.

The substitution of deodorising works for reservoirs at Barking Creek and Plumstead Marshes involves the smallest expenditure of capital, but the largest annual outlay. The capital would not, therefore, be irrevocably sunk; and this plan presents the following advantages, viz., that if the sewerage manure should be found to be of commercial value, it would be available for sale; or should any mode hereafter be discovered by which it could be rendered more profitable, or deodorised more economically, advantage could hereafter be taken of any such improvements. On the other hand, should it appear that the solid manure was altogether valueless, a considerable saving might be effected in the manufacture, by merely precipitating, deodorising, and barging it away, and thus dispensing with the drying process and preparation for sale.

This process would, I conceive, entirely remove the sewerage from the river in a practical point of view; and, by presenting the sewerage in a dry, inoffensive, and portable condition, it would test the very prevalent opinion, that the metropolitan sewerage can be thus profitably applied to agriculture. A further saving of probably nearly half a million might, however, be effected by terminating the sewers and esta-

blishing deodorising works nearer to London, say in the Greenwich Marshes on the south side of the river, and the West Ham Marshes on the north side, which would, in my judgment, accomplish the object desired without creating a nuisance.

I am still, after mature consideration, of opinion that the second proposition, or the extension of the outfalls to Halfway Reach, would fully satisfy the requirements of the Legislature, and be effective in a sanitary point of view, as already explained in my former reports upon this subject. This plan would not greatly increase the engineering difficulties in executing the works; and, as regards expenditure, it presents considerable advantages over any of the other plans.

The extension to Long Reach appears also to meet the required object in a sanitary point of view, although the outfall would not be so remote from habitations as that at Halfway Reach; and, if the former is objected to, it becomes questionable whether this will be considered sufficiently advantageous to justify an increased expenditure of upwards of £750,000.

The discharge of the sewerage into the river at Sea Reach, at all times of tide, may also be regarded as the entire purification of the river; and this point and mode of discharge would probably be considered satisfactory. There are also extensive tracts of marsh and agricultural land along the route of the sewer, over which the liquid manure, or a portion thereof, might hereafter occasionally be made to flow, should it be found, as has been suggested, to be of sufficient value to warrant the formation of the necessary distributory works.

In order to effect this extension, it would become necessary to construct the low-level sewer from Putney to the Greenwich Marshes, at an average depth of ten feet lower than formerly recommended, and to have a branch sewer from Woolwich, to fall into the above main sewer in those marshes, so as to enable the whole of the southern drainage to be carried under the river at Bugsby's Reach without a syphon.

The pumping-station at Deptford Creek would, in such case, be dispensed with, and the sewerage raised into the high-level sewer at Barking. The increased depth of this sewer would enable it hereafter to be extended from Putney to Richmond, without the necessity of another pumping-station; but the actual cost of pumping over the whole area would be considerably increased by the greater depth at the sewer rendered necessary in order to pass under the Thames without a syphon; and the difficulty and risk of executing this work would also be much greater, for the ground through which it would have to be constructed is most unfavourable, consisting of running sand and gravel charged with water, and of so porous a character that the tide in many places rises and falls in it freely for a considerable distance from the river. It is obvious that an increase in depth in such a sub-soil increases the amount of pumping, necessarily prolongs the execution of the works, and adds to the risk of accident or temporary failure, not only in the construction of the main-sewer works, but also in every district sewer which may hereafter have to be connected with it.

Several borings have been made along the line of the river, in order to determine the best place for crossing it; and, although they are all more or less unfavourable on the south side, and indicate that the work will be difficult and tedious, I am of opinion that such crossing may be safely effected by means of coffer-dams and iron culverts.

The sewerage would be conveyed from Barking by one main sewer, in a nearly direct line, to Mucking Creek, in Sea Reach; the greater length of which sewer would have to be tunnelled at a considerable depth below the surface. The sewerage would here be discharged without a reservoir, at all times of tide;—at low water, by gravitation, and at high water, by pumping.

The height of the lift at Barking would be 56·6 feet, requiring 1773 nominal horse power; in addition to which, duplicate engines would be provided.

The lift at Sea Reach would be 22·5 feet, where 1080 nominal horse power would be provided.

The cost of this work has considerably exceeded my anticipation, and it appears to me questionable whether it presents sufficient advantages to justify so large an outlay.*

I have the honour to remain, gentlemen, your obedient servant,

J. W. Bazalgette, Engineer.

Mr. Hows moved, and Mr. Carpmael seconded, the reception of the report, which was at once agreed to.

Mr. Hows moved, and Mr. Doulton seconded, "That the report be taken into consideration at a special meeting of the board, on Wednesday next."

Mr. Leslie said he thought it right to ask Mr. Bazalgette a question, and that was, whether, supposing the line that he had proposed was carried out, regardless of the expense, it would be efficient for the entire removal of all the drainage and all the rain-water of the metropolis?

M. Bazalgette: The whole of my report is founded upon that conviction. I make four propositions, all of which I believe would be sufficient.

Mr. Leslie: Then I beg to give notice that, upon the bringing up of that report next Wednesday, I shall move that it be rejected.

The Chairman: There requires no notice for such a motion as that.

Mr. Leslie felt that, in order to move this as a substantive motion, it was quite necessary, and would put it upon the paper.

Mr. Carpmael: I presume that the former reports of the engineer on this subject will be all upon the paper for that day?

Mr. H. L. Taylor: I was going to put the same question, because as yet we have not disposed of Long Reach nor of Halfway Reach.

The Chairmam: The whole of the reports were referred back to the engineer, and he now brings up an amended report upon them.

The motion was then adopted.

Mr. Bazalgette brought up a number of other reports, and *inter alia* on applications from vestries and district boards to construct sewers in Bevendon Street, Hoxton, and Old Street Road, between Pitfield Street and Curtain Road, Shoreditch parish; Lion Street, Kirby Street, Carter Street, Bowen Street, Crisp Street, Victoria Street and Court, Russell Street, and Ebenezer Street, Poplar, Poplar district; Arthur Street and Cyril Street, Walworth Road, and Cross Street, Kennington Lane, Newington parish; Bernard Mews, Russell Square, St. Giles' district; and Mitcham Road, by Norwood Lane—Coopers' Arms Lane, Stratford Grove, West Place, Taylor's Buildings, Gardener's Lane, Biggs Row, &c., Wandsworth district. On memorial from Michael Willis and others, complaining of dilapidated condition of the Dover sluice outlet, Commercial Road, Lambeth, and requesting that it may be repaired and extended further into the river; and on application from the surveyor to the vestry of Hampstead, requesting this board to alter the gullies connected with the main sewer in the Edgeware Road, so as to accord with alterations now being made in the roadway by the said vestry. Mr. Bazalgette also reported on the communication from the Wandsworth District Board, complaining of the practice of the filling up of cesspools by the owners thereof, in cases where the district board consider it necessary to retain such cesspools, owing to the insufficiency of the existing sewerage, and requesting this board, under section 202 of the Metropolis Local Management Act, to make a bye-law to meet such cases. He recommended the passing of a bye-law making it a penal offence to empty any cesspool into a sewer without leave first obtained from the district board.

The Clerk having been appealed to, expressed an opinion that it was not competent for the board to make such a regulation, it being contrary to the spirit of the act of Parliament.

Mr. Nicholay gave notice, that when the engineer's report on the main drainage was brought forward for discussion, he would call the attention of the board to the plan proposed by Mr. McLean.

CONSTRUCTION OF PORTICOES.

A large number of reports from the architect's department were brought up and dealt with. Among these was one on the supplemental application of Mr. John Arnold, for consent to the erection of a columnar dressing to the doorway, and also to the erection of a stone balcony, in lieu of four old ones, to the front of No. 16, Grafton Street, Bond Street. In the course of the discussion on this report,

Mr. Nicholay (who moved the adoption of the architect's recommendation to permit it) said, he very much regretted that a crusade had been commenced by a certain party in this board against such architectural embellishments, and that the chairman had been enlisted under their banners. He believed the board had no power to prohibit them, and that it was not necessary to make application for permission. In the parish of Marylebone they had resolved to relieve the board from the necessity of refusing what they had no right to prevent.

The Chairman said, as the honourable member had stated that he (the chairman) had plunged into this vexed question, he felt bound to call attention to the real state of the case. It was true that, on two occasions, he had expressed an opinion, but in each of these it had become his duty, as the board was equally divided, to give a casting vote. In giving that vote against these projections, he was influenced only by the consideration that in each case it was proposed to construct them in narrow thoroughfares, where they would have been a positive obstruction to light and air; but, as a rule, he considered that a well-constructed portico added to the architectural beauty of an edifice.

Mr. Leslie said, it would appear from Mr. Nicholay's statement that the parish of St. Marylebone was, under the guidance of the honourable member himself, in a state of rebellion; and that, as usual, they were prepared to set the law at defiance. It was high time for the board to interfere, and prevent what he called "four-post bedsteads" being put up in front of houses, simply to enrich the pockets of the builders who chose to call these abominations "architectural embellishments." The Legislature had constituted this board for the purpose, amongst other things, of acting as an independent tribunal on such questions.

The Chairman said that, though he had resolved to take no part in the discussions of the board, except when officially called upon, he could not let the present opportunity pass without cautioning the members against the danger, which was imminent, of pitting the opinions of one parish against another when arguing questions of this sort. It was all very well for the board to listen to the suggestions of any district board or vestry in whose jurisdiction works of this class were proposed to be executed, but it would seriously imperil the despatch of public business if honourable members sufferred themselves to be drawn into the discussion of parochial differences and feelings.

Mr. Seeley said, if the rules of the board were to be held in contempt, the sooner they ceased to pass them the better; but if, as he believed, they were made in conformity with the intention of the Legislature in calling the board into existence, he hoped honourable members would display a little more loyalty in reference to their enforcement.

After a prolonged discussion, the permission sought by the applicant was accorded.

The cash account presented showed a total general balance of £123,796. 14s. 2d.

The board adjourned at half-past six o'clock.

* In an appendix to this report is given the sectional area of the river at various points along its course; and it must be borne in mind that the sewerage is now discharged at and near to low water, whereas it is proposed hereafter to discharge it at and near to high water.

APPENDIX.

Return showing the Sectional Area of the River Thames at the Undermentioned Points.

	Sectional Area in Feet.			
	Trinity High Water.	Mean High Water.	Half Tide.	Mean Low Water.
Kew, at the Duke of Devonshire's, Chiswick	5,050	....	....	—
Westminster Bridge	22,620	20,460	11,710	6,300
Waterloo do.	22,760	20,480	10,280	3,910
Blackfriars do.	19,830	18,330	9,830	4,530
Southwark do.	16,240	15,310	9,140	4,670
London do.	17,510	16,480	9,560	4,130
Greenwich Marsh, opposite Northumberland and Durham Coal Wharf	42,320	40,100	27,010	14,640
Ditto at crossing of proposed sewer	49,100	46,420	30,640	16,340
Above Barking Creek	64,060	60,900	....	27,580
Below do.	66,320	62,830	40,870	22,000
Halfway Reach, opposite Dagenham Breach	81,290	77,470	54,060	35,170
Erith Reach, at a quarter of a mile north of Erith Church	91,900	87,960	63,330	42,790
Long Reach, opposite Little Powder Creek	93,330	89,950	71,460	53,530
Sea Reach	251,150	219,000	159,000	114,520

CITY OF LONDON COMMISSION OF SEWERS.

Tuesday, Sept. 23.

THE CITY OF LONDON GAS-WORKS.

The Court met this day at Guildhall—Deputy Peacock in the chair.

After the transaction of some ordinary business,

The Chief Clerk (Mr. Daw) read the following letter, received from the superintendent of the City police; the complaint contained in which, at a previous meeting of the court, was referred to Dr. Letheby, to examine and report upon.

City of London Police, Chief Office, August 15.

Dear Sir,—I feel it my duty to draw your attention to a very great nuisance in Whitefriars. A most intolerable smell is emitted from a chimney at the City Gas-Works, where, I understand, an attempt is being made to destroy by fire the refuse of the gas-works.

Our men on duty in the neighbourhood complain that it seriously affects their health; in fact, we are compelled to change men to other beats, to enable them to recover from the poisonous effect of constantly inhaling this gas. Yesterday evening it was particularly bad, and was perceptible as far as the Old Bailey.

I am, Dear Sir, yours truly,

Joseph Daw, Esq., Guildhall. (Signed) John S. Hodgson, Superintendent.

Dr. Letheby then brought up and read the following report thereon:—

To the Honourable the Commissioners of Sewers of the City of London.

Gentlemen,—A complaint has been made to this court by the superintendent of the City police respecting a nuisance in Whitefriars. He states, a most intolerable smell is emitted from a chimney at the City of London Gas-Works, and that it so seriously affects the health of his men who are on duty in the neighbourhood, that he is obliged to change them to other beats, in order that they my recover from the poisonous effects of the gas. In accordance with your request, I have examined into the matter, and have carefully inspected the works of the company. You will, perhaps, remember that this subject has already received the attention of the court, and that proceedings were taken not long since by the Corporation of London against the company, for the purpose of putting a stop to the offensive practice of discharging the foul lime from the gas-purifiers into the River Thames. In consequence of these proceedings, the company were obliged to adopt, at a very considerable expense, a new mode of purifying. By these means the foul lime is deprived of its volatile matters before it is brought out into the air. The process by which this is effected is as follows:—The purifiers are charged with dry lime instead of wet, as was formerly the case, and they also contain a mixture of sawdust and oxide of iron.

The dry lime fixes the sulphuretted hydrogen of the gas, as well as certain cyanogen compounds; and that which the lime fails to arrest is retained by the oxide of iron. Every day one of the purifiers becomes so foul from the fixation of impurities as to require a fresh charge; and, as the lime would evolve a most intolerable odour if it were at once exposed to the air, an arrangement is adopted whereby it is ventilated before it is taken out of the purifier. This is accomplished by removing the oxide of iron, and then forcing a large quantity of atmospheric air through the foul lime. The air charged with sulphuretted hydrogen and very offensive hydrocarbons is made to pass through chambers containing oxide of iron, and thence into a chimney which is 150 feet high. By this means the lime is rendered innocuous, and the sulphuretted hydrogen which it gives up to the air is arrested; but still there are certain hydrocarbons which are not fixed by the process, and these, by escaping into the air, are, no doubt, among the subjects of complaint. Again, the oxide of iron which is taken out of the purifiers before the process of ventilation is set on, is largely charged not only with an excess of sulphuretted hydrogen, but also with a quantity of stinking tarry matter. In this state it is carried to a room which overlooks the Whitefriars Dock, and there, by exposure to the atmosphere, the hydrated sulphuret of iron undergoes a slow process of combustion, by which the mass becomes hot, and in some cases actually takes fire. The iron is thus quickly restored to its original state, and is again fit for the process of purification; but, while all this is going on, a quantity of steam charged with offensive hydrocarbons is continually escaping from the hot mass; and, as the room in which it is placed is freely open to the external air, there is a constant diffusion of foul vapours into the surrounding atmosphere. These, I have no doubt, have sometimes been perceived by the police, especially at that part of Temple Street which bounds the Whitefriars Dock. Another cause of complaint has arisen from the circumstance that, by reason of the failure in the supply of the usual cannel coal, the company were compelled a few weeks ago to resort to the use of a coal which is named Methyl. This produces a tar of a most sickening odour; and, although every precaution was taken to guard against the escape of its vapour, yet a little of the tar was always volatilised at the time of charging the retorts, and also when the spent oxide of iron was removed from the purifier and exposed to the air in the reviving-room. These are, I believe, the principal sources of complaint; and, in referring to them, I am bound to state that the company are exceedingly anxious to do everything in their power to mitigate the nuisances which are unfortunately inseparable from the process of gas-making. They have already appealed to the highest scientific authorities, and have gone to a great expense in carrying out the improvements which have been suggested; but, for all this, according to the statements of the police, the smell from the works is intolerable. In fact, I am informed by the inspector of that district, that every man who has been on duty there has complained of it as a terrible nuisance. They say that the worst smells are perceived at night, when, as I understand, the oxide of iron is being removed from the purifiers to the reviving-room; and they add, that the nuisance is greater now than it was before the new process was adopted. The effect of the smell is to make the men feel sick, and sometimes vomit. They then complain of nausea and loss of appetite, so that they fall away in strength and condition. The inspector told me that he had occasion to pass the works with one of the sergeants about three weeks ago, and the smell from the place was so intolerable that it made both of them vomit. Such facts as these are so forcible, and are apparently so free from prejudice, that we cannot dispute them. The questions, therefore, which arise out of the case are these:—1st. Are the operations at the gas-works conducted in a proper manner—that is, with a due regard to the public comfort, and with the adoption of the best practicable means of abating every possible nuisance? 2ndly. Is the heart of a crowded city a proper locality for conducting a business which is admitted to be injurious to the public health? To the first of these questions I have already replied, by saying that the company have done everything in their power, and everything which Science has suggested, for the mitigation of the nuisances which are inseparable from the business. To the second, I must give an equally emphatic answer, although it is in the negative; for it cannot be doubted that operations which cast into the air all sorts of poisonous vapours—to say nothing of the clouds of smoke which are continually emanating from hundreds of retorts—must be injurious to the public health, and ought to be removed as far as possible from the City walls.

I have the honour to remain, gentlemen, your obedient servant,
(Signed) HENRY LETHEBY, M.B.
Professor of Chemistry, &c., in the College of the London Hospital, and Officer of Health for the City of London.

Guildhall, Sept. 23, 1856.

The report having been received,

Mr. Ross moved, "That a copy of the report just read be forwarded to the City Gas Compay." In doing so, he expressed his gratification at the very great care bestowed upon the subject by their medical officer, whose able and elaborate report thereon reflected the highest credit upon his skill and judgment. Dr. Letheby had told the court that the City Gas Company had very properly adopted every improvement in this manufacture that could be conceived or recommended; but that, notwithstanding this, the nuisance formerly complained of was now declared to be worse than ever. Although the company, in their eager desire to retain their works upon the present site, and to meet thevery just requirements of this court, had done all that Science could suggest to abate the nuisance, yet it now appeared that the very improvements they had effected only tended to increase the evils which were originally complained of. Under these circumstances, it was the duty of the court to interpose, and prevent the continuance of such works in the heart of a large population like that of the City of London.

Mr. ABRAHAM was quite of opinion that some step should be at once taken in the matter, but he did not think that the motion submitted by his friend Mr. Ross went far enough. It appeared to him that the court would not be faithfully discharging their duty to the public if they did not take immediate means for the suppression of the nuisance which had been so long and so loudly complained of, and which was of a most abominable and injurious character. This was a matter that was agitated several years ago, and yet the nuisance remained unremoved; in point of fact, it had increased in intensity since measures had been adopted by the company for its suppression. At that time the commission only went to the extent of opposing the company in endeavouring to obtain a fresh lease for, or an extension of, their premises; and, after the representations made by the court, they did not proceed with their measure before Parliament. The company's existing lease did not expire till 1862; but he (Mr. Abraham) apprehended that the commission, as a sanitary board, were not justified in allowing the nuisance to continue to the great annoyance of the public, and to the detriment of their health, for six or seven years longer. He quite concurred with the medical officer, who had stated that there were no means which the company could adopt that would prevent the manufacture of gas being a nuisance to all persons residing in the immediate vicinity of the works; and that, as far as possible, such manufactures should be removed from crowded neighbourhoods. Considering, therefore, that it was the duty of the court to interpose on the present occasion, and that the motion just submitted would have no practically beneficial tendency, he was of opinion that, instead of a copy of the report being sent to the gas company, the matter should be referred to the general purposes' committee, with instructions to them to take a legal opinion as to the power of the court to deal with it as a public and injurious nuisance.

Mr. Ross said he had no objection to alter his resolution to meet the view of Mr. Abraham.

Mr. ELLIOTT said he would recommend the court to be extremely cautious how they proceeded in this matter. If the evil turned out to be of the intensity alleged, a strong case was certainly made out against the company, who, it might be, had strong enemies. The rival company was not very profitable, and the present proceeding might be a move of theirs to get a combination with other companies. If that were the case, the court, in adopting proceedings, might be placed in an awkward predicament. He was in favour of fair play.

Deputy HOLT: I protest against insinuations of this description. We sit here to discharge our functions like honest and independent men.

The CHAIRMAN: No insinuation is made against us.

Deputy HOLT said he considered Mr. Elliott to have cast an aspersion upon members of the court who were known to be connected with the new gas company, one of whom was himself.

Mr. DE JERSEY said he did not see that Mr. Elliott had made the slightest insinuation against any member of the commission. A complaint had been made to the court by the chief officer of police, and the matter had been referred to the medical officer, who, in the proper discharge of his duty, had made a report upon it, the alleged nuisance seriously affecting the health and comfort of the citizens of London. The police had given evidence respecting the nuisance. They had no shares in the rival gas company, and they came forward and stated, in unmistakeable terms, that the nuisance was of a frightfully annoying character—a statement the correctness of which was guaranteed by the medical officer, who had thoroughly investigated the whole of the circumstances of the case. What, in the name of Heaven, had the court to do with rival companies? They had nothing to do but to see whether an evil existed or not; and if it did, it was their bounden duty to take immediate and active measures for its removal. It appeared to him (Mr. De Jersey) that the question of the public health was superior to the question of the interests of private individuals or public bodies. Was any member of the court prepared to say that the neighbourhood of Whitefriars was a proper locality for the manufacture of gas? The nuisance ought to be at once abated, when it was proved to be of a particularly offensive character, and injurious to the health of the surrounding inhabitants. He trusted that the court would carry out their intentions in a bold public spirit, by agreeing

Price Current.

CASTINGS, per Ton.

Average Weight of Cast-Iron Gas-Pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow	Newcastle.	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1	4 15 0	3 15 0	3 15 0	4 0 0	4 0 0
1½ and 2 inches Socket Pipes	8 0 0	7 5 0	7 10 0	7 15 0	7 10 0
2½ and 3 " " "	7 10 0	7 0 0	7 5 0	7 10 0	7 5 0
4 and 5 " " "	7 10 0	6 15 0	7 0 0	7 5 0	7 0 0
6 in. & upwards " " "	7 5 0	6 10 0	6 10 0	7 0 0	6 10 0
Retorts, 1st fusion, hot blast	7 0 0	...	7 0 0	7 5 0	7 0 0
" 2nd " cold "	8 0 0		7 5 0	7 10 0	7 5 0
Tank Plates, ¼ thick and above	7 10 0	6 15 0	7 0 0	7 5 0	7 0 0

COALS.

NEWCASTLE. Uncreened.	s. d.		SCOTCH CANNEL.	per ton.
Whitwell Primrose	7 0	per ton.	Boghead, at Leith	32s. 0d.
Pelton and Medomsley	7 6	"	Kirkness, best	23 0
Pelaw	7 9	"	Capeldrae, 1st quality	20 0
Burnhope, Eighton Moor, New Pelton, Peareth, South Pelaw, Washington Hutton, and South Peareth	8 0	"	" 2nd "	12 6
Ramsay's Newcastle Cannel	15 0	"	Lesmahago, at Glasgow	25 0
			" " Leith	27 6
			Arniston	22 0
			Wemyss	20 0
			Knightswood	18 0
			Methill	13 0

SUNDRIES.

Best Newcastle fire-bricks	60s. per 1000.	Welch bar iron, in London	£9 per ton.
" " clay	12s. per ton.	Foreign spelter	£28 "
Cliff's fire-bricks at Wortley, 57s. 6d. p. 1000		English block tin	£131 "
Tough cake copper	£107. 10s. per ton.	Banca " "	£135 "
English pig lead	£25 "	Tarred rope yarn	18s. per cwt.

WROUGHT-IRON TUBING, subject to 35 per cent. Discount.

	2 inches.	1½ inch.	1¼ inch.	1 inch.	¾ inch.	½ inch.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent welded tubes, from 2 to 12 feet, per oot	1 8	1 0	0 10	0 7	0 5	0 4½
" " " 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting pieces, or long screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, springs, and elbows—wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron cocks	17 6	9 6	7 6	4 6	3 3	2 6
" with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing sockets, caps, plugs, and nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2 quart	15 0	14 0	13 6	13 0	12 0	

FREIGHTS, per Ton.

Coastwise—Newcastle.		*Foreign.*	
Chatham & Roches-	7s. 6d	Boulogne	8s. 0d
Cork [ter	12 0	Barcelona	32 0
Dover	8 0	Bordeaux	19 0
Dublin	12 0	Cadiz	22 0
Exeter Quay	10 0	Calais	9 3
Folkestone	8 0	Dieppe	11 0
Hastings	8 6	Genoa	32 0
London [mouth	8 0	Hamburg	11 3
Lowestoft & Yar-	7 0	Havre	11 9
Lynn	6 0	Leghorn	24 0
Portsmouth	9 0	Lisbon	22 0
Plymouth	9 6	Rotterdam	10 0
Whitstable	7 3	Stettin	15 6
Weymouth	8 6	Trieste & Venice	35 0

to a resolution which would be the means of referring the matter to a committee, who would probably feel it their duty to consult the solicitor to the commission upon the subject.

Deputy STEVENS said he should support the motion for referring the matter to a committee, as there could not be two opinions with regard to the necessity of getting rid of the nuisance. Let this matter be dealt with by the court in the same manner as they dealt with other nuisances brought under their notice, always bearing in mind that the chief object they had in view was that of promoting and protecting the public health.

The motion, having been altered in conformity with the suggestion of Mr. Abraham, was put to the vote, and carried unanimously.

The court then adjourned.

ATTEMPT TO DESTROY A THEATRE AT LIVERPOOL.—At the Royal Amphitheatre on Friday night, during the performance of the last act of "Like and Unlike," a very strong smell of gas was perceived on the stage, and in a few minutes all the footlights went out. A gas-man on the premises immediately proceeded to ascertain the cause of this unexpected occurrence, and underneath the stage he discovered John Ball, a carpenter occasionally employed about the theatre, in the act of removing a portion of the 1-inch gas-pipe which supplies the stage lights. A saw was found at his feet, evidently the instrument used in sawing the pipe through. The gas was instantly turned off at the meter, or the result would have been dreadful, inasmuch as the pipe in question was only 18 inches below the stage, and threw out a body of gas which would cause a flame 6 feet high. Had it not been thus timely discovered, the dry stage would have been instantly in flames, or the cellars below would have become charged with gas, rendering an explosion inevitable. What the consequences of such a disaster at the time (as the house was crowded, the performance being for the benefit of Madame Celeste) would have been, it is painful to imagine. Ball was brought up before Mr. Mansfield at the police-court on Saturday, and committed to the assizes for trial. He had applied the same evening for employment at the theatre, but as he appeared intoxicated he was refused.

Advertisements.

NOTICE.—INFRINGEMENT OF PATENT.

CRICKMER'S Patent Metallic Packing for Steam-Engines, Pistons, Piston-Rod Stuffing-Boxes, Pumps, &c.—Notice is hereby given that a perpetual Injunction of the High Court of Chancery has been obtained by Messrs. OASTLER and PALMER, trading under the Firm of ALEX. ROSS and CO., Grange Mills, Bermondsey, against Messrs. LITTLE and CHAMBERS, of Manchester, to restrain them from further infringing the above Patent; and that the above Packing can only be obtained of Messrs. ALEX. ROSS and CO., Grange Mills, Bermondsey, LONDON (the Proprietors of the Patent), or by their authorised Agents.

MILL BANDS, HOSE PIPES, & FIRE BUCKETS made to order from the best-selected Oak-Bark Tanned Leather.

Prices Current to be had on application.

RETORT AND BOILER SETTING.

FREDERICK SIMMONDS, Sen.,

No. 11, WELLINGTON STREET, OLD FORD ROAD, Thirty years RETORT SETTER to some of the leading London and Provincia lGas Companies, to whom he can refer, begs leave to draw attention to his economical mode of Setting Clay or Iron Retorts, &c.

F. S. will engage to provide all materials and labour, or labour only.

ALFRED PENNY,

ENGINEER,

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WHARF ROAD, CITY ROAD, LONDON.

Mr. PENNY begs to inform Gas and Water Companies that he undertakes the erection of new, or the alteration of existing, works; and that he may be consulted generally on all matters connected with gas and water supply. He is also prepared to supply best Cold-blast Retorts, Socket-Pipes, and Connections, Iron Borings, &c. &c., and all the necessary Castings used in Gas and Water-Works.

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GAS & WATER WORKS,

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WORKS:

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NO CHIMNEY WANTED FOR

RICKETS'S PATENT CALORIFERE GAS STOVES,

IN CHURCHES, HALLS, OR SHOPS;

And for Conservatories, or any close apartment, a pipe can be attached to convey away the burnt air.

RICKETS'S CHEAP GAS STOVE,

Price £1. 15s.,

Made of sheet-iron, suitable for heating small Counting-houses, Bed-rooms, Cellars, &c.

MANUFACTORY,

AGAR STREET, STRAND, LONDON.

WILLIAM PARKINSON AND CO.,

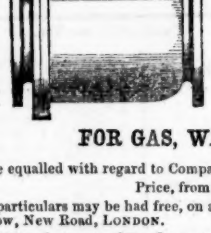
(Successors to the late Samuel Crosley),

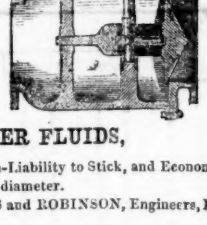
COTTAGE LANE, CITY ROAD, LONDON,

Beg to announce that, in addition to the manufacture of GAS METERS, they continue the manufacture of METERS for MEASURING WATER, SPIRITS, &c., commenced, under Patent in 1849, by the late Mr. William Parkinson.

These Meters are as simple and durable as the Gas-Meter, and as correct as that instrument in the registration of the fluids passing through them.

WAILES'S PATENT ECCENTRIC VALVE,





FOR GAS, WATER, OR OTHER FLUIDS,

Not to be equalled with regard to Compactness, Simplicity, Non-Liability to Stick, and Economy in Price.

Price, from 9s. to .2s. 6d. per inch diameter.

Further particulars may be had free, on application to WAILES and ROBINSON, Engineers, Founders, &c. 10, Palace Row, New Road, LONDON.

N.B.—Also Manufacturers of the Long and Short Slide and Screw Valves, for Gas and Water. The Long-Slide Valves for Gas kept in stock.

PATENT FIRE-CLAY RETORTS.—O. BROTHERS and COMPANY, Manufacturers of O. Brothers's Patent, beg to state that these Retorts, being made in one entire operation, and in one piece, of any required shape, length, breadth, and height, are not liable to cracks and fissures, of which there is a just and general complaint; and consequently superior to, and cheaper than, any hitherto manufactured.

GREAT REDUCTION IN PRICES—30 per cent. cheaper than any other Clay Retorts manufactured.

Shape.	Sizes.	Length.	Thickness.	Price at Railway Station, Blackburn.	Price per foot run, of any required length, at Blackburn.
		feet.	in.	£ s. d.	s. d.
Dee.....	12 in. by 12 in.	8	2½	2 0 0	5 0
,, ...	14 in. by 12 in.	8	2½	2 4 0	5 6
,, ...	16 in. by 13 in.	8	2½	2 10 0	6 3
,, ...	18 in. by 14 in.	8	2½	2 16 0	7 0
,, ...	19 in. by 13 in.	8	2½	2 16 0	7 0
,, ...	20 in. by 14 in.	9	3½	3 7 6	7 6
,, ...	24 in. by 15 in.	8	2½	3 12 0	9 0
Round.....	15 in. by 15 in.	8	2½	2 10 0	6 3
,, ...	15 in. by 15 in.	10	2½	3 2 6	6 3
,, ...	18 in. by 18 in.	8	2½	3 0 0	7 6
Oval Retort	18 in. by 12 in.	8	2½	3 0 0	7

All other sizes and shapes in proportion, to order.

References and further particulars may be obtained on application to the Patentee, Gas Works, BLACKBURN.

JUDKIN'S Improved Gas Regulator has the following advantages to recommend it to the consideration of all gas consumers:—1. It can be easily adjusted to supply gas at any required pressure below that of the street. 2. When once adjusted, it will admit of no variation in lights burning, whether they are few or many, whatever the fluctuation of pressure may be. 3. The light being purer by perfect combustion, the atmosphere is more healthy and agreeable. 4. A saving of at least from 25 to 35 per cent. in the consumption of gas is obtained. Its advantages over any other regulator are as follows:—1. It is more simple in its construction. 2. It is more sensitive in its operation, having less friction, as it works only on two steel centres, which are immersed in quicksilver. 3. It is not liable to get out of repair, and requires less attention than a meter itself. N.B.—A Testing Apparatus has been fitted up on the premises of the patentee, 33 and 35, Corporation Street, MANCHESTER; and 98, Fleet Street, LONDON, for the purpose of demonstrating the above facts.

MEAD'S Improved Gas-Meters are constructed of the best materials, the internal parts being of metal capable of resisting the combined agency of gas and water.

MEAD'S PATENT DRY GAS REGULATOR is now used by a great number of gas companies and consumers. It is simple, easily fixed, and when adjusted requires no further attention.

Phœnix Foundry and Gas Apparatus Works, 176, Great Dover Street, Borough, LONDON.

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No. 66, Snow-hill, London.

WILLIAM SMITH, by the improvements he has made in the Wet Meter, and which he has secured by her Majesty's Royal Letters Patent, the accuracy of their registry is rendered certain by the introduction of the adjusting slide and hydraulic, whereby a Perfect Water Level is readily obtained, and the Hydraulic precludes the possibility of abstracting water from the meter by increased pressure or otherwise, thus surmounting the great desideratum of the Wet Meter. In his Patent Equitable Gas Meter neatness and strength are combined, the backs and fronts of the case being stamped by powerful machinery out of thick plate iron (tinned or galvanized); and the internal construction is of the best metal, which will resist the action of any impurity in the gas.

Old Meters may readily have the adjusting slide and hydraulic applied, thereby having accurate measurement assured.

Station Meters, Governors, &c., made on the shortest notice.

MR. HENRY GORE,
CIVIL AND CONSULTING GAS ENGINEER.
OFFICE,
25, YORK PLACE, LEEDS.

WEST and GREGSON,
GAS-METER MANUFACTURERS, &c.
UNION-STREET, OLDHAM.

Station and Experimental Meters, Gas Pressure Registers, Gauges, Experimental Gasholders, Governors, Slide Valves, &c. &c.

W. and G. would respectfully call the attention of Gas Engineers and Managers to their Station-meters, having made and erected the largest in use at the present time, two of which may be seen at the Stockport and Liverpool Gas Works, on application to the respective Engineers.

JAMES FEATHERSTONE,
ENGINEER,
Manufacturer of GASHOLDERS, IRON ROOFS, and every description of Gas Apparatus.
ALLIANCE IRON WORKS,
CLAYTON, near MANCHESTER.

JOHN BENT,
MANUFACTURER OF GAS METERS,
283, BELL BAND ROAD,
BIRMINGHAM,
(Established 1830),

Begs respectfully to call the attention of Gas Companies, Engineers, &c., to his WET GAS METER, made upon the most improved principles, the most admirable materials, and warranted to register correctly.

EIGHTON MOOR GAS COALS.—Parties wishing to be supplied with these first-class Gas Coals will please to apply to Mr. MATTHEW NESBIT, EIGHTON MOOR OFFICE, NEWCASTLE-UPON-TYNE. These coals are well known as among the richest in gas, and working the roundest on the River Tyne. They are extensively used by metropolitan gas works.

GEORGE CUTLER,
GASHOLDER MAKER,
No. 8, WENLOCK-ROAD, CITY-ROAD,
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Contracts for Tanks, Gasholders, Roofs, Purifiers, and all descriptions of Gas Apparatus executed on the most reasonable terms. Improved Slide Valves, Steam, and Range Boilers, and Smiths' Work, of the best materials and workmanship.

BIRTLEY IRON WORKS,
CHESTER-LE-STREET,
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Manufactory for every description of Casting and Machinery for Gas Works and Water Works.

Warehouse in London for Cast-iron Pipes and Connections of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

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ROBERT MACLAREN,
(Successor to Andrew Liddle and Co.,)
IRONFOUNDER AND GAS ENGINEER.

Manufacturer of Patent Iron Tubing, Block Tin, Lead, and Composition Tubing. Cast-iron Gas and Water Pipes of all sizes, and every description of Gas Apparatus.
GLOBE FOUNDRY, GLASGOW.

H. JONES, Gas Meter Manufacturer,
No. 41, OLD-STREET, St. Luke's, London, begs respectfully to call the attention of Gas Companies yto his latest improvements in the WET METER, b means of which water cannot be abstracted, neither can Gas by any possibility pass through the Meter without registering.

JAMES PINCHBECK,
GAS METER MANUFACTURER,
26, CAMDEN-STREET, and 9, PIERREPOINT-ROW,
ISLINGTON, LONDON.

Begs respectfully to announce to Gas Companies and Fitters, that from upwards of 20 years' practical experience, he is enabled to supply a METER combining correctness, durability, and economy.

N.B.—Repairs on the lowest scale.

NOTICE.—Mr. N. DEFRIES, Consulting GAS ENGINEER, begs to inform gas companies and the public, that he is desirous of meeting any gentlemen at his WORKS, NEW ROAD, ST. PANCRAS, where, under his own superindence of the manufacturing department, they will have the fullest opportunity of investigating the many improvements he has recently effected in his ROTARY-VALVE DRY GAS-METER, by which full security will be afforded against leakage and non-registration, even against the searching effects of Cannel Coal Gas. The Rotary-Valve Meter is warranted to register inflexibly correct at a working pressure of half a tenth, and less than a quarter of a foot per hour upon a blue light; and a guarantee will be given to all gas companies to keep it in repair for not less than five years, free of expense. With this meter the gas-supplier may fully depend upon a fair return, and the public upon having a just measurer.

GAS BATHS, GAS COOKING and HEATING STOVES, for all classes. The British Polytechnic Gas-fire, &c. Conservatories and Buildings heated by gas, and perfect ventilation secured.

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Gas-works erected for private houses, where no gas company exists.

By Her Majesty's Royal Letters Patent.

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Experimental and Station Meters of any size made to order on the shortest notice.—Governors, Pressure Registers, Gas-cooking Stoves, and every description of Gas Apparatus.

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A single copy of either of the above-mentioned books will be sent, on application to the Author ONLY, by payment of the postage (1d.).

These little books are written in a simple and familiar style; showing the comfort, convenience, safety, and economy of Gas. They are intended for gratuitous distribution by Gas Companies. They have already done good service, and the author is anxious still further to extend their usefulness.

The present high prices of tallow and oil are favourable to a more general adoption of gas in private houses. Let its advantages, as yielding a pure, cheap, and healthful light, be properly explained, and there will be no difficulty in getting over a few old-fashioned prejudices. Those persons who have experienced the benfits of gas-light never go back to candles or lamps.

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WEST STRAND, LONDON.
Black Rock, Brighton.

J. JONES, Iron Merchant, 6, Bankside, has long been known to sell the following Castings at prices lower than any other house in London:—Socket and Flange Pipes, Bends, Branches and Tees, Syphons, Lamp-posts, Rain-water Pipes, &c.; also, Hot Water Pipes, Elbows, Tees, Cylindrical and Saddle Boilers, and every Fitting for the same. Drawings and Prices of the above on application to J. JONES, Iron Bridge Wharf, 6, BANKSIDE, near the Southwark Iron Bridge.

ARTIFICIAL Hydraulic or Portland CEMENT, for Brickwork, Concrete, Plastering, &c., combines the valuable qualities of the natural Cements, with the additional advantage that it greatly excels them in its cementitious properties; that it is not affected by frost, and does not vegetate in damp situations. Account of COMPARATIVE EXPERIMENTS on the strength of this and other Cements (read at the Institute of Civil Engineers) to be obtained from the Makers, JOHN BAZLEY WHITE and BROTHERS, Millbank Street, WESTMINSTER, who prepare one quality only of Portland Cement.

SHEARS AND SONS'
PATENT DRY GAS METERS
Are supplied to Gas Companies and the Public as the best and simplest Dry Gas Meters in use. They are acknowledged to be of first-rate workmanship and accuracy of registration.—Shears and Sons continue to supply these Meters on the most favourable terms; and they also manufacture Wet Gas Meters, to which they apply their Patent Indices.
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PATENT GAS METER & APPARATUS WORKS,
GRAY'S-INN-ROAD, LONDON,
Manufacturers of WET and DRY GAS METERS, STATION METERS, GOVERNORS, EXPERIMENTAL APPARATUS, GAS STOVES, and LANTERNS.

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Orders promptly executed.

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These Exhausters are in operation both in London and the Provinces, pumping from 10,000 to 70,000 cubic feet of gas per hour. They occupy very little space, and may be set either perpendicular or horizontal.

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GAS EXPLOSIONS PREVENTED by using the Tubes and Fittings Manufactured by
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whose Goods are all well Tested and Warranted.

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John Russell and Co. are the Original Manufacturers, and at present the Holders, of the Patent for Tubes.

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PATENT FLEXIBLE GAS TUBING.
JAMES LYNE HANCOCK'S
Vulcanized Indiarubber Hose Pipes and Tubing. Manufactory (and Warehouse), Goswell-mews, Goswell-road, London.

Gas Companies, Engineers, Gas Fitters, and the Trade generally, are respectfully informed this Tubing is now manufactured to any size, from ¼ inch bore and upwards, in 100-feet lengths, and perfectly cylindrical, either with or without a spiral wire inside.

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PIPES and VALVES, for Gas and Water, from 2 inches to 48 inches bore.

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THOMPSON'S BROMINE TEST, £1. 1s.—BROMINE, 3s. per Ounce.
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APPARATUS FOR DETERMINING THE HEATING POWER OF SAMPLES OF COAL AND OTHER DESCRIPTIONS OF FUEL, £5. 5.,
INVENTED BY LEWIS THOMPSON, ESQ., M.R.C.S.
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STATION METERS, PRESSURE GAUGES, PHOTOMETERS, SPECIFIC GRAVITY APPARATUS, &C.

JAMES MILNE & SON,
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Manufacturers of Consumers' Gas Meters in Tin-plate and Cast-iron Cases; Station Meters, Governors, Patent Gas Regulators, Chandeliers, Glass Lustres, Burners, and Gas-fittings of every description.

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Manufactory—Broad-street, Birmingham,
MANUFACTURERS OF GLASS CHANDELIERS, GLASS LUSTRES, TABLE GLASS, &c. &c.
ELEGANT CRYSTAL GLASS CHANDELIERS, FOR GAS

(Made rom "REGISTERED" DESIGNS), with GLASS BRANCHES, &c.; suitable for DRAWING-ROOMS and BALL-ROOMS. The more extensive use of GAS in private dwellings has induced Messrs. OSLER to direct their particular attention to the manufacture of this class of articles—which, with a view to their general adoption, are offered at very moderate prices. Purchasers can select from a great variety of patterns, to which additions are being constantly made.

THEATRES, CONCERT, ASSEMBLY, AND BALL ROOMS LIGHTED BY ESTIMATE ON THE LOWEST TERMS.

TO GAS COMPANIES, GAS PROPRIETORS, AND GAS ENGINEERS.

JOHN VICKARY

begs to call the attention of the above to his improved METALLIC CASE GAS-METER, an improvement which has met with entire approbation from the various Gas Companies and Engineers to whom he has introduced it, and acknowledged to be the greatest improvement that has been made since the year 1832; at which period a metal was introduced for the construction of the Drum, Syphon, and Float, capable of resisting any impurities arising from either gas or water, which has been found to answer every expectation; as, in repair, Drums of the above date are found in perfect and good condition, when the Outer Case, Valve-box, Inlet-pipe, &c., are quite destroyed and entirely past repair.

J. V. has introduced a coating or lining of the above metal in the Outer Case, Valve-box, Inlet-pipe, &c., thereby rendering the whole as durable as the Drum, as not a particle of tin plate is exposed to the action of either water or gas; and preventing the possibility of gas passing above the water line through the front into the body of the Case to the outlet unregistered, which frequently occurs. When the Meter has been in use for any length of time it is generally found that rust or decay takes place *above* rather than under the water line, which is only discovered when they need repair. Also the Inlet-pipe and Valve-box are generally found quite decayed, which cannot happen in the above improvement.

J. V. feels confident that the above will be found a most desirable and perfect instrument, as it contains all other improvements of utility that have been introduced up to the present time.

The most strict attention is given to the workmanship as well as the registration of every Meter, to render them perfectly accurate.
Station Meters, Governors, &c., made on the shortest notice, as well as Gas Cooking Apparatus of every description, Gas Baths, &c.
Meters sent at the lowest London prices.

Carriage paid to any part of England.

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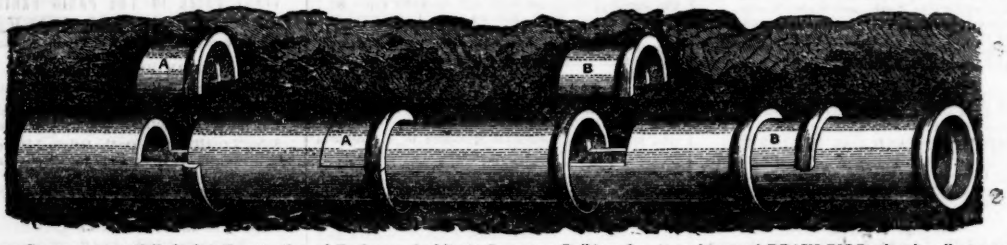

The above Company respectfully invites the attention of Engineers, Architects, Surveyors, Builders, &c., to an improved DRAIN-PIPE, whereby all stoppages may be cleared without disturbing the invert of the drain, by simply removing the cover (marked A or B), whichever may be preferred.
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GAS ENGINEERS AND FOUNDERS,
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Makers of every description of APPARATUS for the MANUFACTURE and DISTRIBUTION of GAS.
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Contracts made for all kinds of Cast and Wrought Iron Gas and Water Apparatus, Clay Retorts, Fire-Bricks, Coals, &c.—Prices, and Lists of Freights and Carriage, sent on application.

HULETT AND CO., 55 AND 56, HIGH HOLBORN,

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Beg to inform the Proprietors of Gas Companies, and the Trade generally, that, having completed their new Gas Meter Manufactory, they are now enabled to supply, with despatch, a very superior article, and can confidently warrant the same to be equal in quality and workmanship to any Gas Meter ever made. Manufacturers of

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GAS FITTINGS.
GAS COOKING APPARATUS, IMPROVED ALBERT,
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COPPER, TIN, BRASS, and COMPOSITION TUBING.

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by which Mains, Service Pipes, and the interior Fittings of a House, may be cleaned out in a few minutes. Price 60s. net.
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Price Lists sent free, on receipt of envelope, addressed and enclosing two postage stamps.

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